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ABSTRACT

This paper focuses on health status and medical service utilization among three subgroups of the elderly population: the poor, the black, and the rural elderly. Economic and demographic characteristics of the elderly are discussed. Available evidence is examined on the relationship between these characteristics and health status to determine whether certain subgroups of the elderly are especially susceptible to health problems and have above average needs for care. Also considered is whether income, race, and place of residence are significantly related to medical care use among individuals with similar health needs. Data presented indicate that the elderly are not homogeneous with respect to their health status. Further, income and race are found to be significantly correlated with health status, though place of residence (urban or rural) is not. Data on medical care utilization demonstrate inequities in the use of care. In particular, blacks, low income groups, and residents of rural areas use less medical care than is commensurate with their health status. These results indicate that despite substantial expenditures and the fact that current programs have succeeded in increasing the elderly's use of medical care relative to the nonelderly, inequities in access to health care for the elderly still exist. (Author/GC)

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Health Status and Use of Medical Services

EVIDENCE ON THE POOR, THE BLACK, AND THE RURAL ELDERLY

LYNN PARINGER
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1215-14

January 1979

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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THE HEALTH POLICY AND THE ELDERLY SERIES

This monograph is one of a series undertaken for the U.S. Department of Health, Education, and Welfare's Administration on Aging. The purpose of the series is to bring together existing information on health policies affecting the elderly for use by policy makers, researchers, and the general public. Each of the five monographs addresses a particular issue or set of issues raised by current health policies or by policy changes under consideration.

The first two monographs examine available evidence on the need for and receipt of medical care among the elderly. Health Status and Use of Medical Services seeks to determine whether certain subgroups of the elderly--the poor, the black, and rural residents--are particularly prone to illness and, if so, whether they receive medical care proportionate to their needs. The second monograph, Long-Term Care: Current Experience and a Framework for Analysis, goes beyond considerations of care for acute illness to address the present use of long-term care services, most of which are provided in nursing homes, and to provide a framework for the development of a comprehensive long-term care strategy.

The next three monographs focus on insurance for medical care, the government's primary contribution to health care for the elderly. Financing Health Care for the Elderly explores the burdens imposed by gaps in current Medicare coverage and the extent to which these gaps are filled by Medicaid and private health insurance. The two types of expenditure that pose the greatest burden--long-term care and prescription drugs--receive special attention in a two-volume study, Expanding Health Benefits for the Elderly. The first volume, Long-Term Care, reviews evidence and options with respect

to services covered, eligibility criteria, organization and allocation of services, patient cost sharing, and administration. Similarly, the second volume, Prescription Drugs, examines policy mechanisms including reimbursement, distribution, cost sharing, utilization review, and claims administration, with sensitivity to the risks as well as the advantages of expanded drug coverage.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS		vii
I.	INTRODUCTION	1
	A. Background	1
	B. Analytical Framework	4
	C. Organization of Paper	6
	D. Summary and Findings	7
II.	SOCIOECONOMIC CHARACTERISTICS OF THE ELDERLY	9
	A. Labor Force Status	9
	B. Poverty Status	11
	C. Living Arrangements	16
	D. Mobility and Place of Residence	16
III.	INDICATORS OF HEALTH STATUS	19
	A. Mortality	21
	B. Morbidity	34
	C. Summary of Findings	58
IV.	MEDICAL CARE UTILIZATION BY THE ELDERLY	61
	A. Physician Utilization	64
	B. Hospital Utilization by the Elderly	90
V.	SUMMARY AND CONCLUSIONS	103
NOTES		107

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I. INTRODUCTION

A. BACKGROUND

As a group, older Americans experience more health problems and use more health services than any other group. Interest in the health status and medical care utilization of the elderly has grown partly because of their rapidly increasing numbers and their growth as a percentage of the overall population. In addition, public efforts through Medicare and Medicaid to reduce the financial barriers faced by the elderly are extremely costly. It is therefore reasonable to inquire about the health care needs of the elderly and whether these needs are being adequately met.

Individuals over 65 years of age currently represent 10.9 percent of the civilian population, compared to 6.8 percent in 1940 and 4.0 percent in 1930. In 1977 there were 23.5 million individuals over the age of 65 in the United States. According to current population projections, by the year 2000 there will be 31.8 million elderly persons in this country.

Not only is the proportion of the population that is aged increasing, but, within the over-65 age category, the proportion aged 65 to 74 is declining while the proportion over age 75 is increasing. Table 1 shows the elderly population in 1977 by age, sex, and race, and the percentage distribution in the different categories. The age distribution of the elderly has important implications for evaluating health status, since "the prevalence of chronic diseases and impairments and the utilization of medical services which increase with age increase more rapidly beginning at about age 75."[1]

TABLE 1

Estimates of the Civilian Population over Age 65
by Age, Sex, and Race,
July 1, 1977
(numbers in thousands)

	Total	Total Male	Total Female	White Male	White Female	Black Male	Black Female
All ages	214,685	103,684	111,001	90,143	95,861	11,723	13,149
65+	23,494	9,569	13,925	8,635	12,681	808	1,125
65-69	8,446	3,739	4,708	3,342	4,201	358	476
70-74	6,137	2,597	3,540	2,365	3,259	199	251
75-79	4,068	1,589	2,479	1,448	2,296	113	155
80-84	2,763	989	1,774	897	1,633	78	124
85+	2,079	655	1,424	583	1,292	60	119
Percentage of total population aged 65 and over	10.9	9.2	12.5	9.6	13.2	6.9	8.6
Percentage distribution of population 65 and over							
65-69	36.0	39.1	33.8	38.7	33.1	44.3	42.3
70-74	26.1	27.1	25.4	27.4	25.7	24.6	22.3
75-79	17.3	16.6	17.8	16.8	18.1	14.0	13.8
80-84	11.8	10.3	12.7	10.4	12.9	9.7	10.6
85+	8.9	4.7	10.2	6.8	10.2	7.4	10.6

Source: U.S. Bureau of the Census, Estimation of the Population of the United States by Age, Sex, and Race: 1970 to 1977, Current Population Reports, Series P-25, no. 721 (Washington, D.C.: U.S. Government Printing Office, 1978), table 3, p. 25.

The projected increase in the proportion of the population that is elderly implies that the cost of programs directed toward improving the status of older Americans will increase substantially if benefit levels are not reduced. The increase in the cost of providing Medicare benefits alone will be great because of the rapidly rising cost of medical care. In 1966, just after the enactment of Medicare, the annual per capita health expenditures of those over 65 were $445. Within a decade, per capita expenditures increased threefold; by 1976, per capita health expenditures of individuals over 65 were $1,521 per year (table 2). Between 1966 and 1976, government spending on health care for the elderly increased by approximately 25.3 percent per year.

TABLE 2

Per Capita Personal Health Expenditures for the Elderly, 1966 and 1976

Type of Expenditure	1966	1976
Total	$445	$1,521
Hospital care	178	689
Physicians' services	90	256
Dentists' services	13	32
Other professional services	12	23
Drugs and drug sundries	62	121
Eyeglasses and appliances	15	19
Nursing home care	68	351
Other health services	7	31

Sources: Marian Gornick, "Ten Years of Medicare: Impact on the Covered Population," Social Security Bulletin 39, no. 7 (July 1976): table 17, p. 16; and Robert M. Gibson, Marjorie Smith Mueller, and Charles R. Fisher, "Age Differences in Health Care Spending, Fiscal Year 1976," Social Security Bulletin 40, no. 8 (August 1977): table 2, p. 5.

Unless society is willing to devote a substantially greater share of resources to providing medical care benefits to the elderly, it is unlikely that current benefit levels can be sustained. An alternative to providing expensive across-the-board coverage to the aged would be to target programs on those groups whose health care needs are greatest. If the low-income elderly exhibit the greatest share of health problems, extension of Medicaid coverage might be considered. If the rural elderly experience a disproportionate share of the problems or if access to care is difficult for them, transportation subsidies might be provided. For alternative policy strategies such as these to be designed successfully, it is important to first understand the variations in the health status of older Americans and the problems they face in obtaining needed medical care. Factors related to both the health status of the elderly and their use of medical care need to be examined in order to identify alternative policy strategies and to evaluate the impact of existing policies.

B. ANALYTICAL FRAMEWORK

There has been considerable research on the determinants of health status and medical care utilization. Some studies have focused on estimating relationships between current health status and variables believed to be related to health, such as income, age, race, education, and geographic location.[2] Others have tried to relate past health practices to current health status, controlling for differences in socioeconomic characteristics.[3] Most of these studies do not focus specifically on the health problems of the elderly, and few of them use the individual as the unit of observation.

In addition to the public policy concerns regarding the effectiveness of current programs in providing for the health care needs of the elderly, special research on the needs of the elderly is desirable for a number of other reasons.

Several studies have shown that lifestyle and early health practices have a significant effect on health status in later years. In addition, the predominant economic view of health as an investment[4] suggests that the elderly may be motivated somewhat differently with respect to their health than the rest of the population. For example, the shorter period of time over which they can recoup the benefits of any health investment may make them less willing than younger individuals to engage in preventive care or to shift to healthier lifestyles.

The view that lifestyle and past health practices may be related to current health status raises the possibility that current relationships of different variables to health may not provide sufficient information to understand the determinants of health status among elderly Americans. Rather, it is also necessary to consider what has happended to these relationships over time. For example, the impact of being black on an individual's ability to purchase good housing and adequate medical care has changed over time. Even if elderly blacks are not seriously discriminated against in the medical care market today, their current patterns of utilization and their health status may reflect the effects of past discrimination. An individual's inability to purchase an adequate diet or obtain preventive health care in the past because of insufficient income may also be reflected in his or her current health status. In addition, elderly Americans with the lowest levels of education may have had to take physically demanding jobs or engage in occupations detrimental to their health. These negative effects on health may be recognized much later in individuals' lives.

In evaluating how effectively public programs provide for the health needs of elderly Americans, several points are worth bearing in mind. First, medical care represents only one of several alternative means of achieving good health. By disproportionately subsidizing this one alternative, society may be expending

more resources than necessary to achieve a given increment in health status. Second, while Medicaid benefits are not age related, Medicare benefits are. They generally begin at retirement, when a great deal of health damage done in earlier years may be difficult to counter. A more rational health policy might be to also subsidize health care at earlier ages, perhaps thereby reducing the number of health problems which occur later in life. Finally, reducing the price of medical care reduces only the financial barriers to receiving care. Other barriers to access, such as time and distance to facilities, and culturally induced barriers (effects of past discrimination) continue to exist. If these barriers are found to significantly influence demand, policies to subsidize indirect expenses such as transportation to facilities and to provide health education to certain population groups may need to be considered.

C. ORGANIZATION OF PAPER

This paper is divided into three major sections. The first section discusses some of the economic and demographic characteristics of the elderly. It provides general background information that is useful in interpreting the results presented in the remainder of this paper. The second section examines the evidence available on the relationship between these demographic and economic characteristics and health status. The information presented will indicate whether certain subgroups of the elderly are particularly susceptible to health problems and and have above-average needs for care. The third section of the paper will focus on the utilization of medical care. For example, if the low-income elderly have a disproportionate share of health problems, one would want to know whether they also use a disproportionate share of health resources. An important question for public policy is to ascertain whether persons with similar health problems use a similar quality and quantity of

medical care or if other factors such as income, race, and place of residence are also significantly related to medical care use among individuals with the same health needs. If these socioeconomic characteristics continue to be significant determinants of use, it may indicate that certain groups of the elderly are disadvantaged with respect to access to medical care. This inequity might suggest need for the development of special compensatory strategies designed to increase the use of medical care by certain disadvantaged groups.

D. SUMMARY AND FINDINGS

In general, the findings in this paper support the idea that the elderly are not a homogeneous group with respect to their health status. Furthermore, factors such as income and race are significantly correlated with health status. The extent of the relationship depends partly on the health status measure being used. Measures of health status such as chronic conditions, activity restrictions, and disability days are negatively related to income. In addition, blacks exhibit significantly lower health status than whites when these indicators are compared by race. Place of residence (urban or rural) is not, in general, associated with significant differences in health status.

When the determinants of medical care utilization by the elderly are examined, it is clear that health status as measured by chronic conditions, activity restrictions, and disability days is an important indicator of service use. However, if health status variations are controlled for, inequities in the use of medical care are apparent. Blacks, the low-income elderly, and residents of rural areas use less medical care relative to other groups than is commensurate with their health status. This result indicates that despite their substantial expenditures and the fact that they have succeeded in increasing the

elderly's use of medical care relative to the nonelderly, current programs have not yet fully provided for equity of access in the use of medical care by the elderly.

II. SOCIOECONOMIC CHARACTERISTICS OF THE ELDERLY

In comparison with the rest of the population, elderly Americans are poorer, more likely to be widows or widowers, less mobile, less likely to be in the labor force, more likely to live in rural and nonmetropolitan areas, and more likely to have health problems. However, although they differ significantly in many social, economic, and health characteristics from the younger population, the elderly are by no means a homogeneous group. Within the over-65 population there are considerable differences in income and education levels, marital and family status, labor force status, and geographic location. While the primary focus of this paper is on income, race, and place of residence, other characteristics are also of importance and often make interpretations of data very difficult.

A. LABOR FORCE STATUS

Within the population aged 65 and over, there are substantial differences in employment status by age, education, and place of residence (table 3). Over a third of the male population aged 65 to 69 was employed in 1970, compared to 11 percent of those over 75. The employment rate of females aged 65 to 69 was four times as high as that of females over 75. These differences could be due to increases in health problems of the over-75 age group which preclude labor force participation, as well as to mandatory retirement policies (many firms force workers to retire at the age of 70). Black males are somewhat less likely to be active in the labor force than the total male population, but the reverse is true for black females.

TABLE 3

Percentage of Over-65 Population Employed by Age and Sex, 1970

	All Races	Black
Male		
65 and over	23.8	22.2
65-69	37.5	33.7
70-74	21.4	18.2
75+	11.3	11.2
Female		
65 and over	9.4	12.0
65-69	16.3	18.1
70-74	8.5	10.5
75+	4.1	5.9

Source: U.S. Bureau of the Census, Social and Economic Characteristics of the Older Population: 1974, Current Population Reports, Special Studies, Series P-23, no. 57 (Washington, D.C.: U.S. Government Printing Office, 1975), table 25, p. 27.

As is true of the younger population, the labor force participation rates of the aged increase with education, particularly among white males (table 4). This trend is not as strong among females. The increasing labor force participation rates by education level may stem from a variety of factors. More highly educated individuals may be in less physically demanding occupations and, therefore, better able to work despite any health problems they might have (lack of health problems may also be due to job characteristics). Furthermore, the more highly educated may be clustered in occupations where the retirement age is more flexible.

The employment status of the elderly, in addition to being related to level of education, varies dramatically by place of residence. In rural farm areas, 40 percent of white males and 32.5 percent of black males over the age of 65 are

in the labor force; in urban areas, only 25.2 percent of white males and 23.9 percent of black males over 65 are employed (table 5). There are several possible explanations for the higher labor force participation rates in farm areas. Individuals living in these areas may be more likely to be self-employed or working in jobs that do not have mandatory retirement ages. In addition, residents of rural areas may be healthier than their urban counterparts and better able to participate in the labor force.

TABLE 4

Percentage of Population Aged 65 and Over in Labor Force, by Years of School Completed and Sex

		White	All Other
Male		22.1	21.8
Education			
Elementary:	0-8 years	16.6	17.5
High School:	1-3 years	22.5	35.4
	4 years	25.1	38.0
College:	1 or more years	36.8	32.9
Female		8.1	9.5
Education			
Elementary:	0-8 years	5.4	10.0
High School:	1-3 years	10.3	8.9
	4 years	9.9	9.6
College:	1 or more years	11.7	2.1

Source: U.S. Bureau of the Census, Social and Economic Characteristics of the Older Population: 1974, table 27, p. 28.

B. POVERTY STATUS

A substantial proportion of the elderly live in poverty. This proportion varies by race, level of education, and place of residence. In 1973, 10.5 percent of all families headed by elderly persons lived below the low-income

level.[1] Breakdowns by race and sex indicate that 8.1 percent of families headed by elderly white males lived below the low-income level, compared to 25.4 percent of families headed by elderly black males; and 10.2 percent of families headed by elderly white females lived below the low-income level, compared to 43.9 percent of families headed by elderly black females.

TABLE 5

Residence and Labor Force Status of the Over-65 Population by Sex and Race, 1970 (percentage living in each location)

	Urban		Rural Nonfarm		Rural Farm	
Age, Sex	White	Black	White	Black	White	Black
Male						
65-69	68.8	76.1	23.3	19.3	7.8	4.6
70-74	69.4	75.0	23.4	20.4	7.2	4.6
75+	69.6	73.1	24.2	22.5	6.3	4.5
(percentage 65+ in labor force)	25.2	23.9	19.6	20.3	40.0	32.5
Female						
65-69	73.9	79.0	20.6	17.6	5.4	3.4
70-74	75.5	77.9	19.9	18.7	4.7	3.3
75+	75.8	76.9	20.2	19.7	4.0	3.4
(percentage 65+ in labor force)	10.4	14.3	8.0	9.3	7.6	8.0

Source: U.S. Bureau of the Census, General Social and Economic Characteristics: United States Summary, 1970 Census of Population, Final Report PC(1)-C1 (Washington, D.C.: U.S. Government Printing Office, 1972), tables 85, 90, pp. 1-380, 1-390.

Racial differences in poverty status continue to be apparent in comparisons of blacks and whites by place of residence. Elderly whites in each residential location were half as likely as elderly blacks to be living in poverty in 1969 (table 6). For both races, individuals living in rural nonfarm areas had the highest incidence of poverty and those in urban areas had the lowest.

TABLE 6

Percentage of Persons Aged 65 and Over
Living below the Poverty Level,
by Race and Residence,
1969

Race	Urban	Rural Nonfarm	Rural Farm
White	21.0	34.4	23.7
Black	42.7	65.2	55.8

Source: U.S. Bureau of the Census, General Social and Economic Characteristics: United States Summary, tables 85, 90, pp. 1-380, 1-400.

Among the elderly, there is a direct relationship between the educational attainment of the family head and the likelihood that the family lives below the poverty level (table 7). The relationship is particularly strong for families headed by white males, and is not as clear for families headed by white females. Lack of sufficient sample size makes it difficult to discern any relationship between education and poverty status when the family head is black. Among families headed by males with less than eight years of schooling, those that are black are over twice as likely to be living in poverty than those that are white. Black families headed by females with less than eight years of education are nearly four times as likely to be living below the poverty level as families headed by white females with less than eight years of education. Thus, even after controlling for education, the financial status of the black elderly appears to be considerably worse than that of whites. At every level of educational attainment but one, white families headed by females are more likely to be living in poverty than white families headed by males.

TABLE 7

Percentage of Families below the Low-Income Level, by Educational Attainment of Family Head, 1973

(family head 65 years or older)

Male-Headed Families	White	Black
Total	8.1%	25.4%
Elementary: 0-7 years	14.7%	31.6%
8 years	8.7%	a
High School: 1-3 years	5.2%	a
4 years	4.4%	a
College: 1-3 years	4.9%	a
4 or more years	3.3%	a
Median school years	7.2	4.7
Female-Headed Families		
Total	10.2%	43.9%
Elementary: 0-7 years	13.8%	50.3%
8 years	7.5%	a
High School: 1-3 years	10.4%	a
4 years	9.8%	a
College: 1-3 years	a	a
4 or more years	a	a
Median school years	8.1	5.2

Source: U.S. Bureau of the Census, Characteristics of the Low-Income Population: 1973, Current Population Reports, Series P-60, no. 98 (Washington, D.C.: U.S. Government Printing Office, 1975), table 36, pp. 118-19.

a. Base less than 75,000.

Lack of income is generally thought to limit a person's ability to purchase adequate housing and meet nutritional requirements, and evidence from the Health and Nutrition Examination Survey (HANES) conducted by the National Center for Health Statistics suggests that this is true. Data from that survey show that a substantial percentage of the elderly are not meeting recommended allowances for a number of nutrients (table 8). The percentage is higher for blacks and for those below the poverty level. With respect to housing, an Urban Institute study by Struyk concludes that about 17 percent of households headed by the elderly in urban areas inhabit dwellings that are physically deficient, plagued by problems with their mechanical subsystems (e.g., heating, plumbing), or located in an unpleasant neighborhood environment.[2]

TABLE 8

Percentage of the Over-60 Population with Nutrient Values Less than Standard by Race and Poverty Status

	Below Poverty Level		Above Poverty Level	
Nutrient	White	Black	White	Black
Calcium	40.43	44.67	34.41	47.71
Iron	62.66	67.31	46.97	64.57
Vitamin A	61.45	62.40	55.56	52.24
Vitamin C	59.16	54.65	38.96	43.78

Source: National Center for Health Statistics, First Health and Nutrition Examination Survey, United States, 1971-1972: Dietary Intake and Bio-Chemical Findings (Washington, D.C.: U.S. Government Printing Office, January 1974), table B, p. 19.

C. LIVING ARRANGEMENTS

In addition to disparities in income and labor force status, there is also considerable variation in the marital status and living arrangements of older Americans (table 9). For both males and females, as age increases, the probability of having a spouse present decreases and the probability of being widowed increases. At every age, men are considerably more likely to be living with a spouse present and less likely to be widowed than women, primarily because women have longer life expectancies and because men tend to marry women younger than themselves. Unless the elderly who are widowed or single move into institutions or become part of extended families, the probability that they will live alone increases with advancing age and is likely to be higher for women than men. Individuals living alone need to rely more heavily on the medical care sector to meet their needs, since they lack families and spouses as viable substitutes. Hence, access to medical care is a need that may become even more acute with advancing age. The probability of institutionalization also increases with advancing age. Only 2.1 percent of those aged 65 to 74 and 7.1 percent of those aged 75 to 84 live in institutions. However, 19.3 percent of the population over 85 years of age are institutionalized.[3]

D. MOBILITY AND PLACE OF RESIDENCE

Aged Americans, on average, are much less mobile than the rest of the population. The elderly change residence at only half the rate of the total population. In 1970, about two-thirds of the elderly lived in metropolitan areas and about half of these lived in central cities. Twenty-seven percent of the population over 65 lived in rural nonfarm and rural farm locations (table 4). Within the over-65 population, the percentage living in rural or urban areas does not vary greatly by age. Elderly blacks are somewhat more likely than elderly whites to reside in urban areas.

TABLE 9

Marital Status of Persons 65 Years and Over by Age and Sex, 1970

Marital Status & Sex	Age 65-69	70-74	75-79	80-84	85+
Male					
Single	7.1%	7.3%	7.3%	7.6%	10.8%
Married	80.6	75.8	68.8	58.0	43.4
Spouse present	76.9	72.1	64.5	52.9	37.7
Spouse absent	3.7	3.8	4.3	5.1	5.7
Separated	1.6	1.5	1.4	1.3	1.3
Other	2.0	2.3	3.0	3.8	4.4
Widowed	8.8	13.8	21.2	32.0	43.4
Divorced	3.5	3.1	2.7	2.4	2.4
Female					
Single	7.4	7.8	8.4	8.8	10.7
Married	52.0	40.0	27.9	17.2	10.7
Spouse present	49.1	37.4	25.4	14.8	8.5
Spouse absent	2.9	2.6	2.4	2.4	2.3
Separated	1.5	1.1	.8	.6	.6
Other	1.5	1.5	1.6	1.8	1.7
Widowed	36.5	49.0	61.1	71.9	76.9
Divorced	4.1	3.3	2.7	2.1	1.7

Source: U.S. Bureau of the Census, Social and Economic Characteristics of the Older Population: 1974, table 8, p. 7.

Place of residence, in addition to being related to poverty and labor force status, provides an indication of access to medical care. The lower physician-to-population ratios in rural areas combined with the longer travel time to medical care facilities suggest that the rural elderly may be at a disadvantage in obtaining adequate medical care.

The discussion above has highlighted the fact that the elderly cannot be considered a homogeneous group. Older Americans vary greatly in terms of income status, level of education, and place of residence. These factors in turn are expected to be related to health status and need for medical care. The types of relationships that exist between health status and these factors will be the subject of the next section.

III. INDICATORS OF HEALTH STATUS

Defining "good health" is no easy matter. The most frequently quoted definition of health is that of the World Health Organization: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity."[1] For the purposes of this analysis, a narrower interpretation of health is employed, focusing on the negative aspects of health--specifically, mortality, morbidity, and functional impairment. This approach is taken for several reasons. First, digressions from acceptable functioning are easier to recognize, and thus to measure, than the somewhat more illusive concept of perfect health. Second, from a policy standpoint, conditions that fall below a minimum threshold of acceptability are of more interest than the question of defining an ideal state. The subject of this paper is physical health, although it is understood that physical health is often closely related to mental and social well-being. Mental and social factors are considered only to the extent that they appear to directly affect physical functioning.

Death appears to be the only truly objective measure of health status, and, as such, it will not be affected by social, economic, or cultural differences in the perception of what constitutes good health. During the early 1900s and especially the 1930s, mortality rates declined rapidly. As time advanced, variations in death rates between the more affluent and the disadvantaged began to disappear, and considerably more attention was focused on morbidity and health impairments.

At this time also, "it was recognized that the very considerable advances of medicine and surgery in prolonging life often resulted in the creation of large numbers of individuals who, although chronically ill and impaired, nevertheless had many years of life before them."[2] Today's elderly are among those who benefited substantially from earlier reductions in mortality rates. Life expectancy at birth in 1930 was 59.7 years; by 1975 it had increased to 72.5 years. Today, a person can look forward to 16 more years of life after reaching the age of 65.

It is difficult to tell whether the reductions in mortality rates were accompanied by increases in morbidity rates. The morbidity measures that currently exist were developed in the 1960s and indicate that there have been no substantial increases in morbidity associated with mortality declines since 1965. Although there is only a single mortality measure, there are a variety of morbidity measures currently being used to describe health status. Each of these measures focuses on a different aspect of health, and together they are useful in describing the various health characteristics of the elderly. However, the existence of a number of different health status indicators makes it difficult to generate a consensus on exactly how well the elderly fare with respect to their health.

In the sections that follow, information on the health status of the elderly will be presented. Health measures used will include mortality rates, morbidity and disability statistics, data on activity limitations, and self-perceived health status. An effort will be made to relate variations in each health indicator to variations in the social and economic characteristics of the elderly. This will help make it possible to correlate need for care with certain mutable and nonmutable characteristics of the aged. To the extent that

certain attributes related to health are subject to manipulation, it may be possible to suggest policy strategies to improve the health of the elderly, taking into account the effect that the nonmutable characteristics have on health status.

A. MORTALITY

Death rates are one indication of the health status of different population groups. Information about when and why people die provides an indication of the problems preceding death--including the possibility of inadequate medical attention. Previous research has also linked variations in death rates among different population groups to different socioeconomic characteristics. Low income, which constrains a person's ability to purchase goods and services related to good health, has been cited as one factor that is positively related to premature death. Race, education, and geographic location have also been linked to variations in death rates among the population.

Two principal measures of health status can be devised from mortality statistics. One is a measure of death rates, or the percentage of a population that dies during a given interval. Comparisons of population groups on the basis of death rates and cause of death provide useful information on specific health problems facing a particular group at a point in time. The second measure devised is life expectancy, which takes into account the differing probabilities of dying at various ages. Both of these measures are discussed below, beginning with life expectancy.

1. Life Expectancy

In 1975, life expectancy at birth was 77.2 years for white females and 69.4 years for white males. Among "all others," life expectancy was 72.3 years for females and 63.6 years for males. Table 10 shows the expected years of

remaining life for different ages by race and sex in 1975. The table demonstrates that although there are significant differences between the life expectancies of nonwhites and whites at birth, these differences decline with advancing age. At age 66, the life expectancy of nonwhite males exceeds that of white males, and by age 71, the same is true for females. By the age of 85, nonwhites have substantially longer life expectancies than whites. In general, racial differences in mortality rates among the elderly suggest that nonwhites who survive into very old age, perhaps because of the process of natural selection, tend to be hardier on the whole than white persons of the same age. Odin Anderson describes this pattern, noting

> a generally recognizable phenomenon in demography that groups with relatively poor health experiences and very high death rates in childhood and early adulthood show low mortality in extreme old age.[3]

Similar patterns are evident in Albania and Greece; both nations have very high early mortality rates, but the lowest mortality rates in the world for persons over age 65.[4] To determine whether the longer life expectancy of aged nonwhites is a recent phenomenon, 1975 life expectancy data were compared with 1960 data. The 1960 data also show that the advantage whites have in life expectancy declines with age, with nonwhites experiencing more favorable rates beginning in their late sixties.

The somewhat longer life expectancy of elderly nonwhites suggests that in a stationary population, there would be a slightly higher percentage of the nonwhite population than of the white population in the highest age categories. Since age is positively related to morbidity, this might indicate slightly higher disability rates among elderly nonwhites. Information on the population distribution by age in 1977 indicates that among the elderly, nonwhites are slightly more heavily distributed than whites in the over-85 age category

(table 11). However, because nonwhites are also more heavily distributed in the 65 to 69 age category, it is difficult to suggest any differences in morbidity rates between the races on the basis of information on life expectancy.

TABLE 10

Life Expectancy, by Age, Sex, and Race, 1975

	White		All Other	
Age	Male	Female	Male	Female
Birth	69.4	77.2	63.6	72.3
20	51.4	58.6	46.3	54.7
40	33.0	39.4	29.8	36.2
60	16.8	21.9	16.3	20.7
65	13.7	18.1	13.7	17.5
66	13.1	17.3	13.2	16.9
67	12.5	16.6	12.7	16.2
68	12.0	15.9	12.2	15.5
69	11.4	15.1	11.7	14.9
70	10.9	14.4	11.3	14.4
71	10.4	13.7	10.9	13.9
72	9.9	13.1	10.5	13.5
73	9.4	12.4	10.2	13.2
74	9.0	11.8	10.0	12.8
75	8.5	11.2	9.7	12.5
80	6.7	8.6	8.5	11.0
85	5.2	6.5	7.1	9.1

Source: National Center for Health Statistics, Life Tables, Vital Statistics of the United States: 1975, vol. 2, sec. 5 (Washington, D.C.: U.S. Government Printing Office, 1977), table 5-1, p. 5-8.

TABLE 11

Life Expectancy, by Age, Sex, and Race, 1960

	White		All Other	
Age	Male	Female	Male	Female
Birth	67.4	74.1	61.1	66.3
20	50.1	56.2	45.5	49.9
40	31.6	37.1	28.4	32.1
60	15.9	19.7	14.9	17.7
65	12.9	15.9	12.7	15.2
66	12.3	15.1	12.3	14.7
67	11.8	14.4	11.9	14.2
68	11.2	13.7	11.5	13.7
69	10.7	13.0	11.1	13.2
70	10.2	12.4	10.7	12.7
71	9.7	11.7	10.3	12.2
72	9.2	11.1	10.0	11.7
73	8.8	10.5	9.6	11.3
74	8.3	9.9	9.3	10.8
75	7.9	9.3	8.9	10.4
80	5.9	6.8	7.0	8.1
85	4.4	4.9	5.5	6.2

Source: U.S. Public Health Service, Vital Statistics of the United Stated: 1960, vol. 2, Mortality, part A (Washington, D.C., 1963), tables 2-4, p. 2-10.

Comparisons in 1960 and 1975 of the life expectancies from birth of whites and nonwhites indicate that the advantage of whites has declined slightly for males and somewhat more substantially for females. In 1960, the life expectancy of white males was 10 percent longer than that of nonwhite males; in 1975, white males had a 9 percent advantage over nonwhite males. The life expectancy of white females was 12 percent longer in 1960 and 7 percent longer in 1975 than

that of nonwhite females. One disadvantage in using life expectancy tables to make comparisons is that the tables are based on aggregate death rates by age, and as such do not reflect the fact that nonwhites have much higher death rates from causes unrelated to illness than whites. Using 1969-71 data, the National Center for Health Statistics (NCHS) estimated the gain in life expectancy that would occur if certain causes of death were eliminated. If life expectancy were recomputed on the assumption that deaths from homicides were eradicated, the life expectancy of nonwhite males at birth would increase by 1.46 years, while that of white males would increase by only .16 years. Accounting for these differences would further reduce the life expectancy advantage of whites. In addition, it is not possible to compare the life expectancies of members of different income groups or residents of different geographic areas. For these comparisons, it is necessary to look at data on death rates.

2. Death Rates

Information on death rates by age, sex, and race is provided annually by the National Center for Health Statistics. Data from 1976 indicate that for both sexes, death rates of whites are lower than those of nonwhites until they reach age 80. At later ages, nonwhites have substantially lower death rates than whites (table 12). This result leads to the earlier finding regarding differences in life expectancy between whites and nonwhites.

Information from 1969-71 on the probability of dying from various causes among the elderly indicates that there are no significant differences between whites and nonwhites (table 13). Diseases of the heart, malignant neoplasms, and cerebrovascular diseases are the most probable causes of death for both whites and nonwhites.

TABLE 12

Deaths and Death Rates, by Age, Color, and Sex:
United States,
1976

(rates per 1,000)

	Male		Female	
Age	White	Nonwhite	White	Nonwhite
65-69	35.4	39.6	16.5	22.3
70-74	53.4	63.9	27.2	44.5
75-79	82.5	84.3	47.5	61.3
80-84	117.7	90.1	77.4	63.3
85+	187.7	115.2	148.2	91.8

Source: National Center for Health Statistics, Advance Report: Final Mortality Statistics, 1976, Monthly Vital Statistics Report, vol. 26, no. 12, supp. 2 (Hyattsville, Md., March 1978), table 1, p. 11.

TABLE 13

Probability at Age 65 of Dying from Various Causes,
by Race and Sex,
1969-71

	White		Negro and Other Races	
Cause of Death	Male	Female	Male	Female
Malignant neoplasms	.164	.128	.168	.112
Diabetes	.016	.025	.018	.035
Diseases of the heart	.460	.468	.401	.436
Cerebrovascular diseases	.122	.171	.146	.190
Influenza and pneumonia	.037	.037	.041	.034
Motor vehicle accidents	.007	.004	.008	.003
All other accidents	.016	.019	.018	.017

Source: National Center for Health Statistics, United States Life Tables by Cause of Death: 1969-71, U.S. Decennial Life Tables, vol. 1, no. 5 (Washington, D.C.: U.S. Government Printing Office, May 1975), tables 11-15, pp. 5-48 through 5-57.

A second factor believed to be associated with mortality rates is income. Lack of sufficient income is partly responsible for the poor housing and unhealthy diets characteristic of the poor population. Information recorded on death certificates does not include data on income. However, several studies have been undertaken to identify the relationship between income and mortality on more restricted samples of individuals. Kitagawa and Hauser matched some 340,000 deaths occurring between May and August of 1960 with 1960 census records to obtain social and economic characteristics of the decedents.[5] Though the data from this study are not current, it remains the best source of information on the simple relationship between income and mortality. Concerning the income-mortality relationship, Kitagawa and Hauser found the following:

- An inverse relationship existed between income and mortality among groups of the elderly. However, this relationship was much more pronounced for younger adult members of the population.
- The inverse relationship existed primarily for white male family members and single white females but not for single males or white female family members.

Kitagawa and Hauser suggest that part of these differences can be explained by the fact that illness prior to death can remove persons from the labor force who would otherwise be working; thus, the family income of an elderly married man is more likely to be affected by his own illness than by the illness of his wife (who is presumably less likely to be working).[6] Unmarried women would be expected to be more likely to be earning their own livings than married women; thus, illness would be expected to exert a negative impact on unmarried women's earnings. Because many people over 65 are likely to be retired, however, it is unclear whether the relatively smaller differentials for older persons should be explained as a function of their lower labor force participation or whether income does exert a causative influence on mortality.

Eric Pfeiffer matched a group of persons found to represent a long-lived elite with a group of 39 subjects who were the first to die in a longitudinal study utilizing a group of 260 community volunteers.[7] The purpose of the study was to isolate factors differentiating the short-term from the long-term survivors. In his analysis of the financial status of these different groups, Pfeiffer found no significant differences in the financial self-assessments made by the two groups of women, but a very significant difference in the financial assessments made by the two groups of men: nearly 80 percent of the short-lived men ranked themselves at the bottom end of the income spectrum (table 14).

TABLE 14

Self-Evaluation of Financial Status, by Longevity Status

Financial Self-Evaluation	Long-Lived	Short-Lived
	Women	
Wealthy	6%	0%
Comfortable	53	59
Marginal or can't make ends meet	41	41
	Men	
Wealthy	0%	0%
Comfortable	70	20
Marginal or can't make ends meet	30	80

Source: Eric Pfeiffer, "Survival in Old Age," in Normal Aging II, ed. Erdman Palmore (Durham, N.C.: Duke University Press, 1974), table 8-11, p. 276.

Note: Short-lived persons were the first 39 persons to die in the 10-year longitudinal study, the average interval from entry into the study being 2.42 years for men and 5.5 for women; long-lived persons were chosen from sources at the end of the study.

Sixty percent of the short-lived men also reported that their financial positions had worsened at age 65, while only 30 percent of the long-lived men reported financial declines (table 15). Given that at the final interview, none of the short-lived men rated themselves wealthy, at least half of the short-lived men rating their financial assets as marginal had been better off at age 55. This suggests that change in financial status in itself could be an important predictor of longevity that might reduce the importance of the absolute level of financial resources. More thorough analysis of this possibility is not available, but would be desirable to clarify the path of causality between sickness and lowered incomes.

TABLE 15

Self-Evaluation of Change in Financial Status since Age 55

Change in Financial Status	Long-Lived	Short-Lived
	Women	
Better	53%	56%
Same	6	19
Worse	41	25
	Men	
Better	45%	25%
Same	25	15
Worse	30	60

Source: Eric Pfeiffer, "Survival in Old Age," table 8-12, p. 276.

A number of regionally focused studies have found higher mortality rates in impoverished areas than in other areas (Chicago, New York, etc.).[8] However, the possible intervention of other variables makes it difficult to determine whether income or other factors associated with income are of crucial significance. The use of crude death rates (for all age groups) obscures the

fact that skewed age distributions (there is a higher concentration of older people in poverty areas) may influence such results. Lerner points out that the relative advantage of high-income states over low-income states, with respect to mortality, was true to some extent in 1930, but by 1957 these differentials had disappeared. For the group aged 65 and over, low-income states (primarily rural with large nonwhite populations) actually had substantially lower mortality rates than high-income states.[9]

The possibility of a dual chain of causation running between current income and mortality rates suggests that use of permanent income might give a clearer picture of the income-mortality relationship. Permanent income measures will not be significantly affected by reduced incomes during the time prior to death. However, available data do not permit comparisons on the basis of permanent income. An alternative variable that is related to income is education. Unlike the income-mortality relation, the education-mortality relation does not suffer from a dual chain of causation: it is improbable that illness prior to death will affect the educational attainment of the elderly.

Kitagawa and Hauser analyzed the relationship between education and mortality among the elderly and found the following:

- There exists an inverse relationship between education and mortality rates that is strong among aged female family members, less strong but inverse among single white females, and small or nonexistent among aged white males.
- Among nonwhite males and females, the inverse relationship between education and mortality exists but is not particularly strong.[10]

One possible reason for the stronger relationship between education and mortality among white female family members is the possibility that it is the education of the female that is most important in affecting the health status of family members. Some of the current literature on household production suggests

that the more education a wife has, the more efficient a producer of both her own and her husband's health she will be.[11]

Results from the study by Pfeiffer provide some support for the findings of income-mortality and education-mortality relationships. Using multiple regression analysis of selected variables related to longevity, the Pfeiffer study revealed that financial status was the most important variable in explaining longer life expectancy for men. Among women, intelligence test scores were the most significant predictor of survival.[12]

The relationship between place of residence and mortality rates among the elderly is subject to a number of competing hypotheses. On the one hand, urban living is associated with crowded, unhealthy living conditions and poor air quality. On the other hand, the rural elderly are more likely to live in houses with inadequate plumbing and to lack access to medical care facilities. Each of these situations is conducive to higher mortality rates.

Kitagawa and Hauser report positive gross correlations between mortality rates and the percentage of population living in metropolitan areas. The correlations are statistically significant (.19 for males 65 and over and .11 for females 65 and over) but unreliable since they do not control for any other factors.[13] There is no reliable indication that rurality itself has an effect on mortality rates, even for the highest-risk population, the elderly. As Milton Roemer states:

> The impact of a region's general economic development and its health technology has become so decisive that the differentials in death rates of populations are greater between the geographic divisions of the United States than between rural and urban localities as such.[14]

Indeed, the Kitagawa and Hauser correlations may reflect these regional differences.

More recent data suggest that differences in death rates among the elderly by place of residence are slight and that there is no consistent pattern relative to urbanization (table 16). The lack of any relationship between urbanization and death rates may be confounded by lack of data on mobility of elderly Americans, particularly mobility that is related to health status. It is possible that the rural elderly with serious health problems have migrated to urban areas in an effort to improve their access to medical care. It is also possible that poor health status may discourage any change of residence. Information on either of these possibilities is needed before differences in death rates by place of residence can be assessed.

The information presented here suggests that while socioeconomic characteristics are related to mortality rates among some groups of the elderly, the relationship is not nearly as strong as it is for younger member of the population. Since factors unrelated to illness are much more important causes of death among younger members of the population (nearly one-half of all deaths of black men aged 15 to 44 are due to accidents or homicides), it would be interesting to compare the education-mortality and income-mortality relatonships for illness-related deaths only. Also, since the Kitagawa-Hauser study is nearly 20 years old, it is time to reassess some of these relationships. Most current research on the determinants of mortality rates does not use the individual as the unit of observation, nor does it focus on death rates among the elderly. Since the Kitagawa-Hauser study suggested that certain factors such as income, education, and race have a different impact on death rates among the elderly than on death rates among the rest of the population, it may be useful to treat the elderly separately in any analysis. In addition, the intricate relationship between sex, race, income, and education must be sorted out before the impact of any one factor on death rates can be estimated.

TABLE 16

Death Rates for Person 75 Years of Age and Over According to Race, Sex, and Place of Residence, 1970

Location of residence and county characteristic	Total resident population 75 years and over in thousands	All races[a]			White		Black	
		Both Sexes	Male	Female	Male	Female	Male	Female
		Death rate per 1,000 population age 75 and over						
United States	7,530	97.85	116.36	86.08	117.80	86.84	103.96	78.52
Within SMSA	5,109	97.08	116.00	85.62	117.49	86.39	103.78	78.60
Large SMSA	2,923	97.31	115.86	86.26	117.34	87.13	103.91	78.41
Core counties	2,223	97.12	115.41	86.22	117.04	87.20	104.21	78.67
Fringe counties	700	97.91	117.31	86.41	118.24	86.91	101.61	76.26
Medium SMSA	1,562	97.21	116.67	85.22	118.24	85.88	103.71	79.45
Other SMSA	624	95.71	115.00	83.54	116.29	84.12	103.40	77.51
Outside SMSA	2,421	99.46	117.04	87.10	118.40	87.87	104.30	78.33
Adjacent to SMSA	1,230	99.36	116.71	87.38	118.22	88.37	101.55	75.02
Urbanized	503	99.38	116.41	88.08	117.48	88.55	101.38	81.22
Less urbanized	616	99.31	117.21	86.83	118.87	88.13	102.48	73.36
Thinly populated	111	99.49	115.32	87.02	117.98	88.88	b	69.88
Not adjacent to SMSA	1,191	99.56	117.38	86.82	118.60	87.35	107.16	81.75
Urbanized	305	99.15	118.38	86.65	120.23	87.24	103.73	81.12
Less urbanized	657	99.63	117.81	86.59	118.80	87.12	110.60	81.64
Thinly populated	229	99.90	115.03	87.77	116.22	88.18	101.11	83.54

Source: U.S. Department of Health, Education, and Welfare, Health: United States, 1967-1977 (Washington, D.C.: U.S. Government Printing Office, 1977), table 25, p. 167.

a. Includes all races not shown separately.
b. Figure does not meet standards of reliability or precision.

33

B. MORBIDITY

Measures of morbidity include the incidence of acute illness, the prevalence of chronic disease, and the seriousness and duration of these conditions in terms of restricted activity days, bed disability days, medical attention, and functional limitations. In addition, self-assessments of health status provide an indication of just how people evaluate their own health problems. This section of the paper will address various measures of morbidity and relate them to the demographic and socioeconomic characteristics considered in the previous section on mortality. An analysis of variations in the incidence of acute illness will first be considered.

1. Acute Illness

The Health Interview Survey (HIS) defines an acute illness as an illness lasting less than three months. Examples of acute illness include most infectious and parasitic diseases, as well as influenza and pneumonia. When making comparisons among groups on the incidence and duration of acute illness, it is important to bear in mind that influenza consititutes a sizable proportion of all acute illnesses (43 percent of all acute illnesses were due to influenza and colds in 1975).[15] Because of the epidemic nature of influenza, its incidence, and hence the incidence of acute illness, varies substantially from year to year. To the extent that some groups are more likely to suffer from influenza than others, comparisons of population groups on the basis of acute illness incidence will vary from year to year and may not provide consistent indications of differences in health status. Most available information on the incidence of acute illnesses among the elderly does not break out statistics on flu and colds from other acute illnesses.

In general, the incidence of acute illness episodes is lower among persons over 65 than among younger people. Older persons presumably have established immunity to the many childhood diseases and, due to retirement, have fewer possibilities of exposure to communicable illnesses. The incidence of acute illness among individuals over 65 is 91.3 cases per 100 individuals per year compared to 123.4 cases per hundred among individuals aged 45 to 64. However, the duration per case of acute illness is substantially higher among the elderly, who average 13.3 restricted activity days and 5.8 bed days per case of illness compared to 8.0 and 3.3 days respectively for individuals aged 45 to 64.[16]

Very little information on variations in the incidence of acute illness by race is available. A 1964 study by Darsky and Weeks shows that blacks in Chicago are four times as likely as whites to report illnesses from infective and parasitic diseases.[17]

The relation between acute illness and income is not clear. Data from the Health Interview Survey suggest a U-shaped relation between the incidence of acute conditions and family income (table 17).

These differences could be due to variations in the perception of illness by income class. It is possible that the highest-income groups are more likely to recognize and respond to minor illnesses than lower-income groups. One of the peculiarities of the Health Interview Survey is that it records illness conditions only if they either resulted in restricted activity or were medically attended. Both the highest- and lowest-income groups have greater insurance coverage than the middle-income elderly and hence are more likely to obtain medical attention. Perception differences may result in the high-income classes' reporting restricted activity for minor illnesses. A final possible explanation for the absence of a very strong relation between the incidence of acute

conditions and income could be that no such relation in fact exists. Perhaps the probability of coming down with the most common acute health problems (colds, influenza, indigestion) is not related to income or health practices.

TABLE 17

Incidence of Acute Conditions per 100 Persons per Year, by Family Income (for Persons over 65), 1971-72

Income	All Acute Conditions	Medically Attended Conditions	Activity-Restricting Conditions
All Incomes	109.2	76.1	78.2
Less than $3,000	111.3	70.0	86.2
$3,000-$4,999	106.6	73.4	80.9
$5,000-$6,999	82.0	58.1	55.0
$7,000-$9,999	113.0	86.4	81.9
$10,000-$14,000	112.5	89.6	65.7
$15,000 and above	145.8	119.7	87.4

Source: National Center for Health Statistics, Acute Conditions: Incidence and Associated Disability, United States, July 1971-June 1972, Vital and Health Statistics, Series 10, no. 88 (Washington, D.C.: U.S. Government Printing Office, January 1974), table E, p. 6.

Information on the incidence and duration of acute illness by sex and geographic location has been available from the Health Interview Survey since 1966-67 (table 18). Differences in the reported incidence of acute illness by place of residence do not exhibit any consistent relation over time and it is not apparent that the elderly residing in any one place are better off than those residing elsewhere. As stated earlier, fluctuations in illness rates over time generally reflect epidemics of influenza. However, regardless of whether an epidemic or nonepidemic year is examined, there is no apparent relationship between the incidence of acute illness and place of residence.

TABLE 18

Incidence of Acute Conditions, Restricted Activity Days, and Bed Disability Days, by Place of Residence and Years for Those over 65 Years of Age

	SMSA			Rural Nonfarm			Rural Farm		
Years	Total	Male	Female	Total	Male	Female	Total	Male	Female
	Incidence of Acute Conditions per 100 Persons								
1966-67	102.0	97.2	105.5	107.8	93.5	118.7	94.1	a	132.5
1967-68	94.5	83.6	102.4	94.9	84.3	103.4	144.7	a	183.7
1968-69	101.4	90.6	109.1	99.6	95.0	103.2	98.5	a	a
1969-70	98.9	78.5	113.5	109.9	75.0	135.9	108.7	a	a
1970-71	102.7	79.5	119.3	109.2	97.1	118.1	116.7	113.6	198.8
1971-72	110.8	98.0	119.8	106.6	99.6	111.8	108.6	a	a
1972-73	95.5	90.8	98.7	105.7	110.3	102.3	79.8	a	a
1974-75	91.9	80.2	100.0	91.5	66.1	109.0	78.8	a	a
	Restricted Activity Days per Incident								
1966-67	7.5	6.0	8.4	7.8	7.2	8.1	12.1	a	12.3
1967-68	8.3	7.0	9.1	11.1	8.8	13.5	8.8	a	7.6
1968-69	10.5	10.3	10.6	9.4	7.7	10.7	9.6	a	a
1969-70	8.8	8.3	9.1	10.8	15.4	8.9	7.9	a	a
1970-71	9.4	8.3	9.9	10.4	9.6	10.9	9.4	5.2	8.5
1971-72	10.2	7.8	11.5	9.8	8.2	10.9	9.0	a	a
1972-73	10.9	9.5	11.7	11.1	9.8	12.1	13.8	a	a
1974-75	13.4	13.1	13.6	13.4	12.4	13.9	9.0	a	a
	Bed Disability Days per Incident								
1966-67	2.8	2.2	3.2	2.7	2.2	3.0	3.7	a	4.1
1967-68	3.7	3.0	4.1	4.7	3.6	5.4	2.9	a	2.6
1968-69	4.7	4.1	5.0	3.4	3.0	3.8	6.0	a	a
1969-70	3.9	3.9	4.0	3.6	6.2	2.5	4.2	a	a
1970-71	3.2	2.5	3.5	4.8	3.8	5.3	4.7	4.1	3.2
1971-72	4.7	3.2	5.5	4.0	3.6	4.2	2.6	a	a
1972-73	4.5	4.3	4.6	4.2	3.6	4.6	5.6	a	a
1974-75	5.8	6.2	5.5	6.1	5.3	6.4	a	a	a

Sources: National Center for Health Statistics, Acute Conditions: Incidence and Associated Disability, United States, July 1966-June 1977, Vital and Health Statistics, Series 10, no. 44 (Washington, D.C.: U.S. Government Printing Office, March 1968), table 11, p. 22; idem, Acute Conditions: Incidence and Associated Disability, United States, July 1967-June 1968, ibid, no. 54 (June 1969), tables 11-13, pp. 20-22; idem, Acute Conditions: Incidence and Associated Disability, United States, July 1968-June 1969, ibid., no. 69 (February 1972), tables 11-13, pp. 20-22; idem, Acute Conditions: Incidence and Associated Disability, United States, July 1969-June 1970, ibid., no. 77 (August 1972), tables 11-13, pp. 21-23; idem, Acute Conditions: Incidence and Associated Disability, United States, July 1970-June 1971, ibid., no. 82 (April 1973), tables 11-13, pp. 21-23; idem, Acute Conditions: Incidence and Associated Disability, United States, July 1971-June 1972, ibid., no. 88 (January 1974), tables 11-13, pp. 22-24; idem, Acute Conditions: Incidence and Associated Disability, United States, July 1972-June 1973, ibid., no. 98 (January 1975), tables 11-13, pp. 21-23; idem, Acute Conditions: Incidence and Associated Disability, United States, July 1974-June 1975, ibid., no. 114 (February 1977), tables 11-13, pp. 19-21.

a. Sample size too small to make reliable estimates.

Table 18 does indicate, however, that women tend to report more acute illnesses than men. In addition, the associated length of restricted activity and bed disability per incident is greater for women than it is for men. Part of this difference may be due to an underreporting of illness by men.[18] Furthermore, women are more heavily distributed in the over-75 age category and therefore would be expected to have more serious health problems.

The lack of multivariate analysis of acute illness makes it difficult to draw any conclusions regarding the independent influence of each factor on the incidence and duration of acute illnesses. The bivariate analysis presented here suggests the following relationships which should be further investigated:

- The relationship between the incidence of acute conditions and income is such that a higher incidence is reported at both income extremes.
- The incidence of acute conditions does not vary significantly by place of residence, regardless of whether the data examined are for epidemic or nonepidemic years.
- Women report a higher incidence and a longer duration of acute illness than men, and this is true regardless of place of residence and the year for which comparisons were made.

2. Chronic Illness

While the incidence and duration of acute illness provide one indication of well-being, acute conditions have a much smaller impact on health status among the elderly than among younger members of the population. As individuals reach age 65, the importance of acute conditions in limiting activity declines, while the importance of chronic conditions increases dramatically. Today, four out of five elderly persons suffer from some form of chronic illness. The Health Interview Survey defines a chronic health condition as one that lasts at least three months or that is identified in a list of conditions defined by NCHS to be chronic regardless of duration. Examples of chronic health problems

include cancer, hypertension, stroke, heart trouble, and diabetes, which are some of the most important causes of death and disability among the elderly. The effects of chronic health problems on the health status of individuals vary widely. Over 50 percent of the elderly population in the United States today have no activity restrictions. However, between 3 million and 4 million elderly Americans are functionally dependent, requiring varying levels of long-term care to carry on daily living activities. As well as influencing the need for long-term institutional care, chronic health problems may be an important indicator of need for physician care, particularly that which is ongoing in nature. In addition, individuals suffering acute attacks of chronic illness are the principal users of short-term hospital facilities.

Both the prevalence of chronic health problems and the activity restrictions accompanying them vary among different groups within the elderly population. These variations in prevalence and seriousness provide an indication of differences in need for medical care. By assessing the impact of income, race, and residential location on the level of chronic health problems, it is possible to determine whether certain segments of the elderly population exhibit special needs for care.

Offsetting factors may make it difficult to observe racial differences in chronic health problems. On the one hand, the somewhat longer life expectancy of elderly blacks suggests that they might be hardier than their white counterparts and less susceptible to chronic diseases. On the other hand, the lower incomes and educational levels associated with being black suggest that blacks may have more than their share of health problems.

Some of the evidence available from the Health Interview Survey on racial differences in reported chronic health problems among the aged during 1965-67

shows that 85 percent of elderly blacks and 86 percent of elderly whites reported having one or more chronic health conditions.[19] A second study, conducted by Ohio State University, found that the prevalence of chronic health problems resulting in some form of activity limitation was slightly higher for blacks than whites among individuals aged 65 to 74 (50.0 percent for blacks and 48.6 percent for whites).[20] Among persons over the age of 75, 71 percent of blacks had activity-limiting chronic conditions compared to 62.1 percent of whites. While approximately the same proportion of blacks and whites report chronic illness, the percentage of chronic conditions resulting in restrictions is higher for blacks. Blacks may be less likely to report minor chronic conditions, perhaps because of lack of information. A study by Darsky and Weeks on the urban elderly found that urban blacks are somewhat more likely to report chronic illness than urban whites; 89.3 percent of blacks aged 65 to 74 compared to 80.5 percent of whites report chronic health problems, and 87.5 percent of blacks over 75 compared to 83.6 percent of whites have chronic conditions.[21]

Although evidence on differences in chronic illness between nonwhites and whites is not conclusive, there is some evidence that indicates a difference in the type of chronic health problems experienced by blacks and whites. The Darsky and Weeks study, as well as NCHS, collected information on the prevalence of various chronic health problems among the elderly by race. The results of these studies suggest that blacks are somewhat more likely than whites to suffer from hypertension and arthritis. Whites are more likely to report chronic health problems arising from coronary heart disease and chronic sinusitis.

More important perhaps than the presence of chronic health problems is the degree to which they inhibit the individual from fully functioning. A study by Wan indicates that blacks are more likely to experience disability from chronic

illness than whites.[22] In addition, the prevalence of severe chronic disability is higher among blacks than whites. The Health Interview Survey also compares whites with other races on the basis of activity limitations.[23] Elderly whites are less likely to have activity limitations than "all others." In addition to being more likely to have activity restrictions, blacks are more likely than whites to be unable to carry on their major activity.

Information on the prevalence of chronic conditions by income class has been collected in a number of different studies (table 19). Statistics on the prevalence of chronic health problems show a much more marked relationship to income than those on acute conditions. As shown in table 19, despite differences in the income categories examined, the year a particular survey was undertaken, and the definition of the dependent variable, the trends point quite consistently to a strong inverse relationship between income and the incidence of chronic conditions. In a study of the health status and utilization behavior of noninstitutionalized persons over 65, Nagi finds a negative correlation between income and number of health conditions (-.24).[24]

The Wan study of the elderly living in low-income areas also found a negative correlation between income and the incidence of chronic disability. Persons in the middle-income categories, whose incomes ranged from $5,000 to $14,999, reported the lowest incidence of chronic disability.[25] The incidence of moderate and severe disability declined with income to the $10,000-$14,999 category, which had half the rate of moderate and severe disability that the group with incomes below $5,000 had. Older persons with incomes above $15,000 were likely to report more severe and moderate disability than those in the middle-income categories. This result is somewhat inconsistent with HIS data, which indicated that an inverse relationship existed throughout all income

TABLE 19

Noninstitutionalized Persons over Age 65 with Chronic or Lasting Conditions

	Percentage with Conditions
HIS (1963-64)[a]	
Income:	
Under $3,000	86.2
$3,000-3,999	84.6
$4,000-6,999	79.7
$7,000-9,000	78.3
$10,000 and over	76.3
All incomes	82.8
National Senior Citizens Survey (1968)[b]	
Income:	
Less than $1,000	66.6
$1,000-1,999	62.3
$2,000-2,999	62.1
$3,000-4,000	55.3
$5,000 and over	44.1
NCHSR (1975)[c]	
Income:	
Less than $5,000	52.1
$5,000-9,999	44.3
$10,000-14,999	32.0
$15,000 and over	39.4
Rhode Island (1974)[d] (Men)	
Income:	
Less than $2,000	77.8
$2,000-3,000	69.6
$4,000-6,000	58.2
$6,000 and over	58.6

Sources: National Center for Health Statistics, Age Patterns in Medical Care, Illness, and Disability: United States, July 1963-June 1965, Vital and Health Statistics, Series 10, no. 32 (Washington, D.C.: U.S. Government Printing Office, June 1966), table 22, p. 48 (HIS); Institute of Interdisciplinary Studies, Indicators of the Health Status of the Elderly in the United States (Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1972), table 38, p. 101 (National Senior Citizens Survey); T. H. Wan, "Access to Care, Health Status, and Health Services Utilization by Non-Institutionalized Persons in Low-Income Urban Areas" (Paper delivered at the Gerontological Society Meeting, San Francisco, November 18-22, 1977), table 3, p. 9 (NCHSR); Robert G. Bornight, "Chronic Morbidity and the Socio-economic Characteristics of Older Urban Males," Milbank Memorial Fund Quarterly 43 (July 1965): 311-22 (Rhode Island).

a. Persons with chronic conditions.
b. Lasting, continuing health problems.
c. All levels of chronic disability.
d. One or more chronic conditions.

ranges. A sizeable discrepancy in the percentage reporting severe activity restrictions in the Wan study and the percentage reporting inability to carry on major activity in the HIS series suggests that there are definitional differences between the terms used in the two studies. The Wan study is more recent. However, because only individuals living in low-income areas were included in the sample, results of the Wan study may not adequately reflect the health status of the elderly nationwide.

The National Senior Citizens Survey also studied the activity limitations of the elderly by income status. It reports an inverse relationship between income and activity restrictions for each of three age cohorts of the elderly.[26] Like the Health Interview Survey, the National Senior Citizens Survey found that when persons over and under 75 are considered separately, income differentials narrow considerably for the over-75 group and, in some cases, reverse themselves.

When analysis of activity limitations is confined to the low-income population, substantial differences between public assistance recipients and nonrecipients are evident. Health Interview Survey data from 1968 show that two out of three elderly persons receiving public assistance also reported activity limitations from chronic conditions, while less than 50 percent of nonrecipients with incomes below $5,000 reported such problems.[27]

In addition to race and income, another factor believed to be associated with the prevalence and seriousness of chronic conditions is place of residence. Much of the evidence currently available shows little or no systematic variation in health status between residential categories. Information on the population over age 65 collected by NCHS shows that activity limitations do not differ significantly by place of residence.[28] The only distinguishing characteristic

is that individuals living in nonmetropolitan areas in the South are more likely to have activity limitations than individuals in other areas. Even when activity limitations are broken down by seriousness of impact, no major differences by place of residence are evident.

If attention is focused on the low-income elderly, particularly on the differences between those receiving Old Age Assistance and those not receiving aid, there is somewhat more variation in health status. Information from the Social Security Administration's 1973 Survey of the Low Income Aged and Disabled shows that individuals living on farms or in open country are more likely to experience severe activity limitations than those living elsewhere.[29] Even more significant differences are related to assistance status. Individuals receiving aid were almost twice as likely to report severe activity limitations than nonrecipients, regardless of place of residence.

When information by type of condition is examined, some urban-rural differences begin to appear (table 20). Low-income elderly living in farm areas are more likely to experience chronic back trouble, musculoskeletal problems, and stiffness or deformity of foot, leg, arm, or hand than persons living elsewhere. These conditions are likely to be occupationally related and their higher prevalance among the rural elderly is likely to be the result of the heavy physical demands of farming and related occupations.

TABLE 20

Number and Percentage of OAA Recipients and Nonrecipients with Chronic Conditions, by Area of Residence, 1973

Chronic Condition	OAA Recipients					Nonrecipients				
	Total	Farm or Open Country	Small Towns	City		Total	Farm or Open Country	Small Towns	City	
				Small	Large				Small	Large
Total number (in thousands)	1,665.2	378.7	554.6	253.3	475.6	13,628.9	2,561.6	4,478.2	2,422.8	4,136.0
Percent:										
Neoplasm	6.4	6.1	6.7	7.3	5.9	4.6	4.4	4.7	6.0	3.8
Endocrine	16.0	14.5	15.8	15.7	17.4	10.9	10.0	11.0	11.6	10.9
Mental	26.1	30.6	28.5	24.4	20.3	10.2	11.7	10.5	10.2	8.9
Nervous	2.9	2.2	3.0	4.0	2.8	1.7	1.4	1.6	1.8	2.0
Circulatory	71.9	77.2	72.7	69.9	67.8	57.3	59.3	59.1	57.5	54.1
Respiratory	25.0	25.6	26.5	24.7	22.9	18.3	22.6	17.3	18.0	17.1
Digestive	30.2	32.5	31.4	25.4	29.4	19.7	25.5	19.2	18.7	17.4
Genitourinary	16.3	24.0	17.2	14.9	9.9	6.7	11.1	6.8	5.0	4.9
Skin	6.2	4.6	6.2	6.8	7.0	5.4	4.8	6.1	5.8	4.9
Musculoskeletal	63.2	68.5	64.4	60.3	59.0	47.4	56.5	46.4	46.8	43.1
Stiffness or deformity of foot, leg, arm, or hand	24.0	30.6	23.1	24.2	19.6	13.3	16.2	12.0	12.8	13.4
Chronic back trouble	24.8	28.0	26.4	22.4	21.6	15.2	18 6	15.4	13.2	13.9
Spinal deformity	9.4	9.9	9.1	9.9	9.0	6.7	8.7	6.5	5.4	6.6
Ill-defined	4.5	3.3	4.3	4.8	5.7	2.3	1.7	1.9	2.7	2.8
Other:										
Hearing	24.0	26.3	27.2	23.3	18.8	16.5	16.5	17.8	16.8	14.6
Visual	30.5	31.2	32.7	31.1	26.6	15.2	13.2	15.5	15.4	15.7

Source: John L. McCoy and David L. Brown, "Health Status among Low-Income Elderly Persons: Rural-Urban Differences," Social Security Bulletin 41, no. 6 (June 1978): table 5, p. 21.

The evidence on chronic conditions presented thus far indicates how the incidence of these illnesses varies by age, race, income, and residential location. Unlike acute conditions, which are of short duration and do not have lasting effects, chronic conditions have long-term impacts which affect an individual's behavior, his ability to earn income, and the general quality of his life. In addition, the presence of chronic illness has important implications regarding the use of medical care, particularly that which is used on a continuing basis. The following section will discuss whether those characteristics related to chronic illness also imply a higher than average utilization of medical services. Identification of variations in the level and seriousness of chronic illness among the elderly suggests the following:

- There is a greater prevalance of chronic conditions among nonwhites, and their conditions are more serious than those experienced by whites. Furthermore, these differences persist even when income or place of residence is controlled for.
- Low-income elderly have substantially more health problems than the elderly in higher-income categories. Differences between assistance recipients and nonrecipients are particularly strong.
- The direction of causation between income and chronic health problems is as yet unclear, and more research is needed before it can be determined.
- Low-income rural residents exhibit a somewhat higher prevalence of chronic health problems than urban residents after controls for age, sex, and race are included.

3. Disability Days

While the incidence and duration of acute and chronic illnesses provide some indication of variations in health status, they refer primarily to specific types of health problems which confront the elderly. Acute illnesses are generally viewed as episodic in nature, requiring varying levels of medical attention depending upon their severity. Chronic illnesses, on the other hand,

include health problems that may require more continuous medical care, and their presence exacerbates the health impact of an acute illness attack. In addition, elderly individuals suffering from chronic illnesses may be more likely to permanently alter their behavior patterns in response to chronic health problems.

Disability days are a measure pertinent to both types of illness. They indicate the total amount of time during which persons performed at less than their normal activity level, and therefore represent an additional basis upon which to compare the health status of different groups of the elderly.

Information from the 1971 Health Interview Survey indicates that the elderly experience considerably more days of bed disability and restricted activity per year than younger members of the population (table 21). The elderly experience two to three times as many days of restricted activity as the rest of the population, depending on the sex and race of the groups being compared. Women report more days of restricted activity and bed disability per year than males, but these differences are not nearly as striking as those that exist between whites and nonwhites. Nonwhites experience substantially more days of restricted activity and bed disability than whites. Nonwhites over age 75 spend more than one-sixth of the year performing at less than their normal activity level. Elderly nonwhites report about twice the days of restricted activity and bed disability as whites do. Among elderly white and nonwhite males still employed, nonwhites reported nearly three times as many work loss days (14.6 per year) as whites (5.0 per year).[30]

The 1964 study by Darsky and Weeks provides findings that are somewhat contradictory to those found in the Health Interview Survey. The Darsky-Weeks study, which was conducted in Chicago, concludes that blacks aged 65 to 74 are somewhat more likely to report restricted activity days than whites but that

whites over age 75 report nearly 50 percent more restricted activity days per year than blacks (34.0 days for whites compared to 21.9 for blacks).[31] However, because the Darsky-Weeks survey was conducted in Chicago, its findings may not accurately reflect the characteristics of the elderly nationwide. Surveys that encompass areas other than the Midwest, such as the South, might find the elderly to be less homogeneous, and might find nonwhites to be at an even greater disadvantage in terms of education, income, and discrimination in receiving medical care. In addition, the older data used in the Darsky-Weeks study may not indicate current differences between blacks and whites.

TABLE 21

Days of Restricted Activity and Bed Disability per Person, by Race, Age, and Sex, 1971

	Restricted Activity Days		Bed Disability Days	
	White	All Other	White	All Other
Males	14.0	15.8	5.2	6.5
45-64	18.8	29.0	6.4	10.3
65-74	25.0	43.5	8.3	16.5
75+	35.9	67.8	16.5	32.3
Females	16.6	19.9	6.6	8.6
45-64	20.8	34.4	7.4	13.6
65-74	28.2	59.9	9.8	24.2
75+	43.0	65.2	17.4	35.4

Source: National Center for Health Statistics, Disability Days: United States, 1971, Vital and Health Statistics, Series 10, no. 90 (Washington, D.C.: U.S. Government Printing Office, June 1974), tables 13, 14, pp. 30, 31.

The disproportionate share of blacks in lower-income positions suggests that perhaps restricted activity days should be examined by income class to factor out one reason for the racial differences. NCHS provides information on restricted activity days and bed days by income class but does not break out the information by race (table 22). The information in the table suggests an inverse relationship between restricted activity days and income. This relationship is particularly strong among men. Women over age 65 in the highest-income groups report more days of bed disability and restricted activity than lower-income females over age 65.

TABLE 22

Days of Restricted Activity and Bed Disability per Person per Year, by Family Income, 1971

	Less than $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000-$14,999	$15,000+
			Restricted Activity Days			
Male						
All ages	31.7	21.2	15.3	11.7	10.5	10.1
65-74	42.6	31.9	22.3	12.6	18.5	10.9
75+	49.5	39.1	21.0	29.0	29.7	23.4
Female						
All ages	35.0	20.3	15.2	14.0	13.1	12.6
65-74	41.9	29.0	24.2	24.2	20.4	14.9
75+	50.6	47.0	36.9	33.8	31.5	50.2
			Bed Disability Days			
Males						
All ages	11.8	8.6	5.6	4.2	4.1	3.6
65-74	12.4	14.2	6.0	4.9	5.5	4.5
75+	21.8	17.3	13.5	12.0	a	13.1
Female						
All ages	13.2	8.2	5.8	5.8	5.2	5.4
65-74	13.3	12.6	7.1	11.1	4.3	9.2
75+	19.8	16.9	17.2	14.8	18.4	30.1

Source: National Center for Health Statistics, Disability Days: United States, 1971, tables 8, 10, pp. 25, 27.

a. Figure does not meet standards of reliability or precision (more than 30 percent relative standard error).

Wilson and White provide some insight into differences in disability days between the races by entering a control for poverty status (table 23). The Wilson-White results for 1973 indicate that elderly nonwhites continue to have more restricted activity, bed disability, and work loss days than whites after controlling for poverty status. There were greater differences between nonwhites and whites in restricted activity days in 1973 than there were in 1964, and in both years nonwhites in each income category reported more restricted activity days than whites did. There is some indication that racial differences are lessened somewhat after including a control for income.

TABLE 23

Disability Days per Year per Person Aged 65 and Over, by Race and Income

Year	White		All Other	
	Poor	Nonwhite	Poor	Nonpoor
	Restricted Activity Days			
1964	42.2	32.8	55.5	39.6
1973	34.5	28.2	56.9	45.4
	Bed Disability Days			
1964	12.8	14.1	20.6	16.8
1973	12.1	12.2	24.2	a
	Work Loss Days			
1964	6.2	7.5	7.3	20.8
1973	6.7	5.3	9.4	a

Source: Ronald W. Wilson and Elijah L. White, "Changes in Morbidity, Disability, and Utilization Differentials between the Poor and the Nonpoor: Data from the Health Interview Survey: 1964 and 1973," Medical Care 15, no. 8 (August 1977): tables 7-9, pp. 642-43.

a. Figure does not meet standards of reliability or precision.

The Wilson-White study, in addition to confirming the racial differences found in other Health Interview Survey data, also confirms that regardless of race, persons living above the poverty level experience fewer days of restricted activity and work loss than those living below it, perhaps because individuals with higher incomes are able to purchase better diets, housing, and medical care which in turn results in better health status. Furthermore, elderly individuals with higher incomes may be better educated concerning their health needs and hence more efficient producers of health.

Information from the 1968 Health Interview Survey indicates that even among the low-income elderly, there are substantial differences in restricted activity between individuals receiving public assistance and those not receiving it. Individuals on aid experienced twice as many bed days as those receiving no aid (27.7 days versus 13.1 days) and almost twice as many restricted activity days (64.4 compared to 36.1).[32] These differences may be due to the possibility that those elderly with the most health problems are more likely to seek out and benefit from public assistance. No evidence on this possibility is currently available.

Information on disability days by place of residence is also available from the Health Interview Survey (table 24). Men aged 65 to 74 experience the fewest days of restricted activity if they live in an SMSA and the greatest number if they live on a farm. However, men in this age group living on farms experience the fewest days of bed disability. This result may be due to the higher labor force attachment of rural men. Their illnesses may cause them to restrict their activities somewhat, but the demands of their jobs do not permit them to cut down completely. This possibility is supported by the fact that men over 75 living in farm areas, who are less likely to be working, experience

a greater number of both restricted activity days and bed days than men living in SMSAs and nonfarm areas. Differences in disability days among females aged 65 to 74 by place of residence are not particularly strong. However, females over age 75 experience more bed disability and restricted activity if they live in farm areas. The differences in activity restriction by place of residence are most apparent among individuals over 75. Whether this is the result of inadequte access to medical care or lack of resources among the elderly on farms is not known.

TABLE 24

Disability Days per Person per Year,
by Place of Residence and Geographic Region,
1971

	Place of Residence			Geographic Region			
		Outside SMSA			North		
	SMSA	Nonfarm	Farm	Northeast	Central	South	West
	Restricted Activity Days						
Male							
All ages	14.0	14.8	14.5	13.4	13.3	15.1	15.6
65-74	23.7	30.6	32.1	17.0	27.8	32.0	29.0
75+	34.5	44.0	44.8	36.3	34.4	49.2	31.2
Female							
All ages	17.1	16.9	16.4	16.1	15.1	18.1	19.5
65-74	30.0	32.0	28.6	27.0	24.6	35.3	38.0
75+	42.9	46.5	57.9	38.7	38.3	56.9	42.7
	Bed Disability Days						
Male							
All ages	5.5	5.3	4.9	5.4	4.5	6.3	5.2
65-74	9.1	9.4	6.2	6.5	10.6	10.9	6.5
75+	17.2	17.8	25.9	16.0	13.8	29.2	7.3
Female							
All ages	6.9	6.7	6.0	6.7	6.0	7.4	7.3
65-74	10.6	11.4	10.8	10.2	8.6	13.5	10.9
75+	18.0	19.1	30.5	16.7	14.8	26.2	15.1

Source: National Center for Health Statistics, Disability Days: United States, 1971, tables 2, 4, pp. 19, 21.

The data presented here also show that regardless of age or sex, individuals in the South are in comparatively worse health than those in other areas of the country. Because no multivariate analysis has been conducted, it is not known whether these differences are due to the lower incomes and higher proportions of blacks in the South or whether they are attributable to other causes.

The 1973 Survey of the Low Income Aged and Disabled conducted by the Social Security Administration also provides some information on days ill in bed by place of residence (table 25). The results indicate that among nonrecipients of Old Age Assistance (OAA), individuals living in farm areas were more likely to experience illnesses that cause them to remain in bed for long periods of time than those living in other areas are. However, the rural-urban differences are minor compared to the differences between OAA recipients and nonrecipients: OAA recipients were considerably more likely to experience total bed days exceeding three weeks. This finding is consistent with that of the HIS concerning differences between individuals receiving aid and those not receiving aid.

TABLE 25

Bed Disability Days of Elderly Recipients and Nonrecipients of Old Age Assistance, 1973 (percentage distribution)

	0 Days	1-6 Days	7-20 Days	21+ Days
OAA Recipients				
Large city	55.8%	9.8%	14.1%	20.3%
Small city	55.4	9.8	18.6	16.2
Farm or open country	53.7	9.5	16.6	20.2
Small town	55.4	9.1	16.2	19.3
Nonrecipients				
Large city	71.1%	7.7%	10.4%	10.8%
Small city	69.9	7.4	11.8	10.9
Farm or open country	68.0	8.7	9.6	13.7
Small town	72.2	7.4	11.9	8.5

Source: McCoy and Brown, "Health Status among Low-Income Elderly Persons," table 10, p. 25.

The results of analyzing disability days among the elderly suggest the following:

- Individuals over age 75 experience more disability days than individuals aged 65 to 74.
- Elderly blacks have substantially more disability days than elderly whites. This is true for both men and women, and substantial differences exist even after controlling for income.
- Lower-income elderly experience more disability days than those in higher-income categories. The only exception is among females over 75.
- Differences in disability days among the population aged 65 to 74 by geographic location are not substantial. However, among those over 75, the farm population is the most disadvantaged with respect to health.
- Public assistance recipients exhibit more disability days than nonrecipients, perhaps because the less healthy are more likely to seek aid.

4. Self-Reported Health Status

A final way to evaluate the health status of the elderly is to simply ask people how they feel about their health and their health status relative to others. A report by the Institute of Interdisciplinary Studies maintains that "from a social and psychological standpoint, the medical evidence of the presence of disease may be largely irrelevant. The significant social fact about health is that people who think they are well act well; people who think they are ill act as though they are ill."[33] Despite these advantages of using self-assessment of health as a health status indicator instead of more "objective" clinical evidence and behavioral evaluations, the validity of self-assessment as an indicator has been extensively debated in the literature.[34]

Information on self-assessed health status is available from a variety of studies, and most of the evidence confirms the earlier findings that variations in health status among the elderly are associated with sex, race, age, income,

and other characteristics. The 1973 Survey of the Low Income Aged and Disabled asked individuals to evaluate their health status as excellent, good, fair, or poor (table 26). Nonwhites at all income levels are considerably more likely than whites to rate their health as poor. Additionally, individuals in the lower-income groups are more likely to rate their health as poor than those with higher incomes. These results are consistent with the higher level of activity restrictions experienced by blacks and low-income persons reported in the same survey.

TABLE 26

Self-Rated Health Status of the Elderly, by Poverty Status and Race, 1973

(percentage distribution)

	Income Relative to the Poverty Threshold				
	Less than .75	.75 to .99	1.0 to 1.24	Greater than 1.25	Don't Know
White					
Excellent	3	8	8	10	10
Good	24	22	25	34	33
Fair	38	38	40	39	35
Poor	35	35	27	17	22
Don't Know	a	a	a	a	a
All Other					
Excellent	3	4	2	8	2
Good	16	20	21	25	29
Fair	29	32	28	39	43
Poor	52	44	49	28	26
Don't Know	a	a	a	a	a

Source: U.S. Department of Health, Education and Welfare, Social Security Administration, Office of Research and Statistics, Division of Supplemental Security Studies, "Preliminary Tables from the Low-Income Aged and Disabled (SLIAD): 1973 Aged CPS Component," mimeographed (August 9, 1978).

a. Less than 1 percent.

Self-assessment of health is of particular interest when considering variations in health status associated with different income levels. Using lifetime occupation as a crude indicator of socioeconomic status, Maddox found that persons with backgrounds in manual occupations were more likely to rate their health status lower than their physicians did, while persons with backgrounds in nonmanual occupations tended to err on the side of optimism.[35] Given findings by Palmore of a high association between self-perceived health status and life satisfaction, it is reasonable to expect that low-income persons might also have a tendency to err on the side of pessimism in self-evaluations of health.[36]

Other surveys of persons over 65 show that their assessment of health status is linked to their income class. In a survey of different residential groups in Chicago, elderly homeowners tended to be considerably more optimistic about their health than occupants of public housing and residents of areas with high concentrations of poverty.[37] The National Senior Citizens Survey found that persons with the lowest incomes were more likely to classify their health as fair or poor, while persons with higher incomes were more likely to be more positive (table 27).

TABLE 27

Self-Assessment of Health Status by Persons over Age 65: United States, 1968

(percentage distribution)

	Health Status				
Income	Very Good	Good	Fair	Poor	No Answer
Less than $1,000	12.3	26.0	40.1	21.2	.4
$1,000-$1,999	17.8	24.4	33.3	23.6	.8
$2,000-$2,999	22.2	27.0	35.2	14.9	.6
$3,000-$4,999	23.6	35.4	30.1	11.0	0
$5,000 or more	34.9	37.8	23.3	3.3	.7

Source: Institute of Interdisciplinary Studies, Indicators of the Health Status of the Elderly in the U.S., table 17, p. 88.

Information on self-assessment of health by place of residence indicates that elderly persons in nonmetropolitan counties are 25 to 30 percent more likely to rate their health as fair or poor than their counterparts in metropolitan areas. Thirty-five percent of the nonmetropolitan elderly, compared with 28 percent of the metropolitan elderly, rated their health as fair or poor (table 28).

TABLE 28

Percentage of Population Reporting Health Status as Fair or Poor, by Age and Place of Residence, 1975

Residence[a]	All Ages	Age 65 and Over
Within SMSA	11.5%	27.9%
Large SMSA	11.1	25.9
Core county	12.1	26.6
Fringe county	9.0	24.0
Medium SMSA	11.8	29.5
Other SMSA	12.5	33.2
Non-SMSA counties	15.2	35.0
Adjacent to SMSA	15.2	34.9
Not adjacent to SMSA	15.2	35.0

Source: U.S. Department of Health, Education and Welfare, Health Resources Administration, Health of the Disadvantaged: Chartbook (Hyattsville, Md., September 1977), table 6A, p. 63.

a. Residence terms are defined as follows:

Large SMSA--1 million or more persons
Medium SMSA--250,000 to 1 million persons
Other SMSA--less than 250,000 persons
Core county--county that contains central city
Fringe county--county within large SMSA that does not contain the central city

In general, information on self-assessed health status confirms the variations in the health status of the elderly described earlier. Nonwhites and low-income persons are more likely to assess their own health as poor than

other groups of the elderly are. Rural residents also have a lower assessment of their own health, in keeping with the somewhat more severe activity restrictions they experience.

C. SUMMARY OF FINDINGS

Analysis of the relationship of health status to demographic and socioeconomic characteristics indicates that certain groups of the elderly are more disadvantaged with respect to their health status than other population groups. In addition, the relationships between individual characteristics and health status vary somewhat, depending on the health indicator being used in the analysis.

Information on health status differences between blacks and whites indicates that elderly blacks fare somewhat better than whites when mortality is used as the health indicator, but that they compare less favorably when chronic illness and disability days are used as indicators of health status. Blacks are more likely to experience serious chronic health problems than whites, and blacks generally report more disability days than whites. Blacks are also more likely to rate their health as poor.

The relationship between income and health status is perhaps the most consistent across health indicators. There is a negative albeit weak relationship between income and mortality rates, primarily among elderly married men and elderly unmarried women. Information on acute illness incidence indicates a U-shaped relationship with income, possibly due to differences in illness perception by income class. Data on the prevalence of chronic health problems indicate a significant negative relationship between chronic health problems and income. The severity of activity restrictions imposed by chronic illness is also greater among low-income persons. In addition, information on disability

days indicates that the poor experience considerably more bed days and restricted activity days than wealthier individuals. Low-income elderly are also more likely to rate their health as poor. The lower health status of low-income persons suggests that they have a greater need for medical care, and this need should be reflected in higher utilization rates among the economically disadvantaged.

Comparisons of health status among individuals living in rural and urban locations suggest a different relation, depending on the health status measure being used. Mortality rates among the elderly do not appear to vary by place of residence. The incidence of acute illness is also quite stable across different geographic locations, as is the prevalence of chronic health problems. Among the low-income elderly, individuals living in farm areas appear to experience more chronic health problems than individuals in urban areas. Comparisons on the basis of bed days indicate that the elderly in rural areas may have a somewhat lower health status than those living in other parts of the country, but this is primarily true among those not receiving OAA. For those receiving aid, rural-urban differences do not exist.

One of the principal problems in examining health status differences among the elderly is that the data currently available are generally limited to bivariate tables relating health status to one other characteristic. Multivariate analyses of variations in health status are scarce. It is very difficult to draw any conclusions on the independent relationship of one factor to health status without being able to control for the relationships between other factors. Further complicating this analysis is the problem of two-way causation between variables such as income and health. Longitudinal information on the behavior of individuals over time is needed to sort out this simultaneity

problem. A final concern in identifying some of the relationships is the role that time plays in modifying them. The present health status of the elderly is likely to be a function of relationships which existed over the past 65 years. To the extent that many social and institutional changes have occurred over time, it is likely that current studies may not be measuring the current relationship of different factors to health status. This creates difficulty in making predictions, since tomorrow's elderly will be subject to a whole set of social policies and institutions which differ from those faced by today's elderly.

However, based on the available information, it is possible to generate some hypotheses about use of medical care. Assuming that "need for care" should be the primary determinant of medical care utilization, blacks should be expected to use more services than whites. Also, low-income persons are expected to use a disproportionate share of health services because they experience a disproportionate share of health problems. Residents of rural areas are expected to use services at approximately the same rate as residents of urban areas. Divergence from these predicted findings could suggest inequities in the availability of medical care and might indicate that current policies should be modified or new policies formulated to correct these inequities.

IV. MEDICAL CARE UTILIZATION BY THE ELDERLY

Current policy regarding the provision of medical services to the elderly reflects the view that health care is a right. Most recent efforts to improve the elderly's access to medical care have focused on reducing the financial barriers to obtaining care. There is no question that public programs have increased the utilization of medical care by the aged.[1] In addition, the increases in utilization which occurred after the introduction of Medicare were proportionately greater for the economically disadvantaged than for those in higher-income groups.

Gross comparisons on the basis of physician visits or hospital days for different income, racial, or regional groups can be misleading, since they provide no indication of the use of medical services relative to need. Equitable access should mean that those individuals with similar health problems are able to obtain a similar quantity and quality of medical care. The principal determinant of service use becomes "need," and other characteristics are related to use only insofar as they reflect differences in taste or an ability to substitute home care for medical care.

The previous section, which discussed variations in the health status of the elderly, showed that the most economically disadvantaged are the most likely to have health problems. Elderly blacks also tend to have proportionately more health problems than whites, even after controlling for income differences. Given these variations in health status, it would be expected that blacks and low-income individuals need more health services than other groups.

The fact that these groups need more services today may result partly from their utilization of health services in the past. One possible explanation for the greater incidence of health problems among the poverty population is that the lack of income is a barrier to the utilization of appropriate medical services. Because they might be expected to use preventive health services less frequently than persons with higher incomes, the poor may be more likely to develop illnesses. Once they have developed illnesses, low-income persons might be expected to delay getting medical attention or discontinue treatment prematurely. Such behavior could lead to the development of more serious conditions or the failure to totally cure treatable conditions. Blacks and low-income persons may also be discriminated against in their use of care and restricted to inferior providers who provide "second-class" care. The possibility that prior use of medical care affects current health status has important implications for the elderly and raises some serious policy questions. If today's variations in health status are a function of yesterday's inequities in access to health services, then perhaps policy alternatives that improve the non-elderly's, as well as the elderly's, access to care should be considered. The relationship between past medical care and current health status is an as yet unanswered empirical question that merits further research.

In addition to indirectly affecting health status by restricting utilization of health services, income, race, and other characteristics may affect health more directly through their impact on other health practices (diet, exercise, housing) and on individuals' predisposition to disease. If this is the case, perhaps health policy toward the aged should focus on income maintenance and housing subsidies, in addition to lowering the direct price of medical care.

Andersen developed a very useful framework within which to analyze the demand for medical care. The model views a person's decision to seek medical care as dependent upon three influences: predisposition to seek medical services, ability to secure those services, and need for care.[2] Demographic (age, sex) as well as attitudinal characteristics are used to assess individuals' predisposition to seek medical care. Factors that affect an individual's ability to obtain care include family income, health insurance coverage, and distance to health care facilities. The need component of the model reflects the health status and illness characteristics of the individual. Andersen suggests that "a high degree of equity is assumed when need and the demographic factors are found to be the prime determinants of use. Less equity is suggested when social and economic factors are important."[3]

This section focuses on utilization of medical care as it relates to the health needs of the elderly. The previous section provided some indication of variations in health status by different types of individual characteristics. In looking at utilization data, equity criteria demand that a similar variation in service use by these characteristics be found. Also, when it is possible to control for health status, little variation in service use by individuals with the same health status should be found. Any differences that do exist should be explained primarily by differences in characteristics that determine an individual's predisposition to seek medical care.

The analysis of medical care utilization that follows is divided into two components: use of physician care and use of short-term hospital care. When analyzing data on a service-by-service basis, it is difficult to infer a great deal about inequities in access to health care. If low-income individuals have more hospital days than high-income persons with similar health problems,

this may be due to differences in relative prices facing the two income groups. The poor may be encouraged to substitute inpatient care for outpatient care because they have better insurance coverage for hospital use than for physician care. Alternatively, these variations might suggest that the poor simply postpone seeking treatment for health problems until they become very serious, whereas wealthier individuals seek treatment earlier. In these comparisons of service use, it is also important to distinguish between preventive, elective, and mandatory care, since they have different implications concerning the accessibility of services. With these cautions in mind, an examination of the determinants of medical care utilization by the elderly is in order.

A. PHYSICIAN UTILIZATION

A number of different aspects of the physician/patient interaction are relevant to an analysis of utilization patterns. The average number of physician contacts provides a rough measure of the utilization practices of different population subgroups; however, more refined measures, such as the average number of visits for those who make visits, give a better picture of differences in service provision once an individual enters the system. Although total visits may be the same, one group's visits may be fairly evenly distributed among its members, and another group's visits may be concentrated among a small minority of its members. In the latter case, it is likely that some individuals who do not seek physician care may have clinical conditions that could be treated and cared for if diagnosed. Regular physician contact would appear to reduce the likelihood that minor conditions will develop into more serious problems, and even the healthiest individuals might be able to benefit from preventive health care treatments, such as vaccinations and innoculations, as well as information

about good health care practices. For these reasons, the proportion of a population that sees a physician regularly is of interest in any discussion of physician utilization patterns.

The kind of service received and the place where the service is provided also provide important qualitative information about service provision. Differences in the reasons different people see physicians may indicate the existence of barriers to some forms of care. For example, a tendency to use physicians only for serious problems may mean that some individuals do not avail themselves of--or lack access to--preventive services, symptomatic relief, or other elective services for which a physician's care might not be mandatory. The source of care--doctor's office, emergency room, health clinic--may also be indicative of possible differences in the level of care received.

The elderly use more physician services per year than any other age group except those under five years of age. In 1971, individuals aged 65 to 74 averaged 6.4 physician visits per person per year, and those aged 75 and over averaged 7.2 visits. Health Interview Survey data from 1971 indicate that elderly women use more health services than elderly men (table 29). Within the elderly population, physician visits increase with age, reflecting the more serious health problems of individuals over 75. Health Interview Survey data also indicate a somewhat higher use of physician services by nonwhites, perhaps again reflecting their lower health status. Nonwhite females over age 75 are the only group that experiences fewer physician visits per year than their white counterparts.

TABLE 29

Physician Visits per Person per Year for Individuals over 65 by Sex and Race, 1971

	White	All Other
Male		
65-74	6.0	6.5
75+	6.5	7.2
Female		
65-74	6.7	7.4
75+	7.6	7.4

Source: National Center for Health Statistics, Physician Visits: Volume and Interval since Last Visit, United States, 1971, Vital and Health Statistics, Series 10, no. 97 (Washington, D.C.: U.S. Government Printing Office, March 1975), table 7, p. 21.

One indication of access to the health care system is the percentage of a population subgroup that has had some contact with a physician during a given time period. The Health Interview Survey provides information on the percentage of the elderly population in 1964 and 1973 that had not seen a physician within the previous two years. The data show that between 1964 and 1973 there was an increase in the proportion of the population seeing a physician during a two-year period (table 30). Among whites, the poor population gained both in absolute terms and in relation to the nonpoor population. Among nonwhites, both the poor and nonpoor increased their probability of seeing a physician within a two-year period, but the nonpoor experienced a greater increase than the poor. Since the HIS data do not control for health status, it is not possible to make any definitive statements about equity between the two income groups. Information from the previous section indicates that the poor have a greater share of health problems and that therefore their probability of seeing a

physician would be greater. That this is not the case may be an indication that despite efforts to improve access through Medicare and Medicaid, the poor continue to be less able to meet their health care needs. Racial differences in service utilization suggest that poor nonwhites may have less access to care than poor whites, despite their lower health status. Health Interview Survey data from 1975 indicate no substantial differences in the probability of seeing a physician among groups whose members have yearly incomes below $15,000 (table 31). When whites and nonwhites are considered separately, the probability of seeing a physician increases slightly with income for whites, but nonwhites in the middle-income range are slightly less likely to have seen a physician in the past two years than those in the lowest-income groups.

TABLE 30

Percentage of Population with No Doctor Visits in Previous Two-year Period, by Race and Poverty Status, 1964 and 1975

	White		All Other	
Year	Poor	Nonpoor	Poor	Nonpoor
1964	23.8	18.3	25.8	26.3
1973	17.7	14.5	19.7	14.1

Source: Wilson and White, "Changes in Morbidity, Disability, and Utilization Differentials between the Poor and the Nonpoor," table 3, p. 640.

The Center for Health Administration Studies and the National Opinion Research Center at the University of Chicago (CHAS/NORC) conducted surveys of health service utilization in 1963, 1970, and 1976 (table 32). They found that the percentage of the elderly seeing a physician during the survey year increased between 1963 and 1970. This was true for all income groups and probably reflects increased demand resulting from reductions in the cost of

TABLE 31

Percentage of Persons over 65 with No Doctor Visits in Previous Two-Year Period, by Income, 1975

Income	Percentage with No Doctor Visits
Less than $3,000	15.6
$3,000-$4,999	15.7
$5,000-$6,999	15.3
$7,000-$9,999	15.9
$10,000-$14,999	14.8
$15,000-$24,999	11.6
$25,000+	9.5

	Percentage with No Doctor Visits	
	White	Nonwhite
Less than $5,000	15.6	15.8
$5,000-$9,999	15.4	17.8
$10,000+	12.8	a

Source: Health Resources Administration, Health of the Disadvantaged: Chartbook, table 27B, p. 82.

a. Figure does not meet standards of reliability or precision.

TABLE 32

Percentage of Elderly Population Seeing a Physician during the Year, 1963, 1970, 1976

	1963	1970	1976
High Income	71	82	89
Middle Income	65	85	81
Low Income	67	73	75

	Income Groups		
	1963	1970	1976
High	$7,000+	$11,000+	$15,000+
Middle	$4,000-$6,999	$6,000-$10,999	$8,000-$14,999
Low	$0-$3,999	$0-$5,999	$0-$7,999

Source: Lu Ann Aday and Ronald Andersen, "Fostering Access to Medical Care," in Health Services: The Local Perspective, Proceedings of the Academy of Political Science, vol. 32, no. 3 (New York, 1977), table 3, p. 37.

care brought about by Medicare. Between 1970 and 1976, only the high-income group experienced continued increases in the proportion seeing a physician. Differentials between the high- and low-income groups in the proportion seeing a physician have widened since 1970. The CHAS/NORC results indicate that almost 90 percent of the high-income elderly see a physician during the year compared to 75 percent of the low-income elderly.

Information provided by Kravits and Schneider also indicates that the probability of seeing a physician is lower among the poor than the nonpoor. Data by race indicate that poor blacks are somewhat more likely than whites to have seen a physician in the past year (table 33). These data also differ from HIS data on visits over a two-year period.

TABLE 33

Percentage of Persons over 65 Seeing a Physician during a One-Year Period and Number of Visits for Those with Visits, 1970

	Percentage Seeing Physicians	Mean Number of Visits for Those with Visits
White		
Above poverty	77.3	7.2
Below poverty	67.4	6.7
Total	72.7	7.0
Black		
Above poverty	74.7	7.1
Below poverty	71.0	10.7
Total	71.7	8.2

Source: Joanna Kravits and John Schneider, "Health Care Need and Actual Use, by Age, Race and Income," in Equity in Health Services, ed. Ronald Andersen, Joanna Kravits, and Odin W. Anderson (Cambridge, Mass.: Ballinger Publishing Co., 1975), table 10-1, p. 176.

The Kravits-Schneider data also show that for those who had visits in the past year, poor whites experienced fewer visits than nonpoor whites. Among

blacks this trend was reversed. While blacks and whites above the poverty level with visits experienced about the same number of visits, blacks below the poverty level had substantially more visits than either poor whites or the nonpoor in either racial group. The biggest problem for nonwhites appears to be their initial entrance into the health care system. Once in the system, they seem to receive medical care that is commensurate with their lower health status. Also, since Medicare and most private insurance plans have deductibles, it is possible that once the deductibles are met, there are few additional financial constraints to using more care. The elderly poor are eligible for Medicaid and therefore are not subject to coinsurance. Why poor whites have lower levels of physician care than nonwhites remains an empirical question. Perhaps health status differences can provide a partial answer.

If analysis is focused on the mean number of visits per year, including both users and nonusers in the calculations, the poor are found to have fewer physician visits than the nonpoor. This is true for both whites and nonwhites, and reinforces the idea that barriers to entrance into the health care system may be the primary obstacle to receiving care for poor nonwhites and that these barriers exist, but to a lesser degree, among poor whites (table 34).

TABLE 34

Number of Doctor Visits per Person per Year
for Persons over 65, by Income and Race

	Total		White		Racial Minority	
	Poor	Nonpoor	Poor	Nonpoor	Poor	Nonpoor
1964	6.0	7.3	6.2	7.3	4.9	6.5
1973	6.5	6.9	6.4	6.8	7.0	8.6

Source: Wilson and White, "Changes in Morbidity, Disability, and Utilization Differentials between the Poor and the Nonpoor," table 4, p. 640.

Note: For 1964, the poor are defined as those with incomes below $3,000 and the nonpoor are defined as those with incomes above $3,000; for 1973, the poor are defined as those with incomes below $6,000 and the nonpoor are defined as those with incomes above $6,000.

Information from the 1971 HIS suggests that perhaps there has been a decrease in equity of use between the poor and nonpoor in recent years. In 1971, elderly whites with yearly family incomes less than and greater than $5,000 both averaged 6.7 physician visits per year.[4] Average visits for nonwhites were 6.9 and 7.3 respectively. Thus, between 1971 and 1973, average visits by the nonpoor increased, while those by the poor have either decreased or risen only slightly. Consequently, the gap between the poor and the nonpoor in the use of physician services is widening. Part of this 1971-73 difference may be attributable to the different income categories used to group the two samples in 1971 and 1973.

If the income categories are broken down further, the relation between income and physician visits is less distinct (table 35). Recent data from three different surveys indicate that persons with the highest income report the most visits, but middle-income persons appear to be seeing doctors less frequently than low-income persons. This finding reinforces the belief that Medicare and Medicaid have significantly increased the use of physician services by low-income persons.

Little information on physician use by residence that controls for race and income is currently available. The section on health status indicated that elderly persons living in rural areas had approximately the same health status as those living in urban areas, which would indicate that rural and urban residents have similar probabilities of seeing physicians. However, the lower physician-to-population ratio in rural areas suggests that rural residents may visit physicians less frequently because physicians are less accessible to them. Health Interview Survey data by age, sex, and place of residence indicate that individuals living in farm areas have fewer physicians visits per year

than those in nonfarm areas and SMSAs. This is true regardless of sex or age; however, these data do not control for income (table 36).

TABLE 35

Mean Number of Physician Visits per Year
by Persons over 65, by Income

Income and Data Source	Number of Visits per Year
HIS (1975)	
Under $3,000	6.6
$3,000-$4,999	6.5
$5,000-$6,999	7.0
$7,000-$9,999	7.4
$10,000-$14,999	6.9
$15,000-$24,999	5.8
$25,000 and over	7.4
NCHSR (1975)	
Under $5,000	6.64
$5,000-$9,999	6.73
$10,000-$14,999	5.89
$15,000 and over	7.38
CHAS/NORC (1970)[a]	
Low income	8.2
Middle income	7.1
High income	8.0

Sources: Health Resources Administration, Health of the Disadvantaged: Chartbook, table 25B, p. 80 (HIS); Wan, "Access to Care, Health Status, and Health Services Utilization," table 5, p. 11 (NCHSR); Ronald Andersen, Joanna Lion, and Odin W. Anderson, Two Decades of Health Services: Social Survey Trends in Use and Expenditure (Cambridge, Mass: Ballinger Publishing Co., 1976), table 2-8, p. 50 (CHAS/NORC).

a. Whites only.

TABLE 36

Number of Physician Visits by Persons over 65,
by Sex and Place of Residence
1971

		Outside SMSA	
Male	SMSA	Nonfarm	Farm
65-74	5.9	6.2	5.6
75+	6.5	6.7	a
Female			
65-74	7.2	6.1	6.0
75+	7.6	7.6	6.7

Source: National Center for Health Statistics, Physician Visits: Volume and Interval since Last Visit, United States, 1971, table 3, p. 17.

a. Figure does not meet standards of reliability or precision (more than 30 percent relative standard error).

Andersen et al. report 1970 survey data roughly adjusted for income which indicate that elderly rural residents in low- and middle-income groups were more likely to see a physician in 1970 than comparable urban residents were. For high-income groups, however, the rural elderly were least likely to see a physician (table 37).

TABLE 37

Percentage of Persons over 65 Seeing Physician during the Survey Year,
by Place of Residence and Income,
1970

	SMSA Central City	Other Urban	Rural	All Residences
Low income	69	74	75	73
Middle income	80	88	90	85
High income	93	78	73	82

Source: Andersen, Lion, and Anderson, Two Decades of Health Services, table 2-3, p. 45.

Data from 1975 indicate that the percentage of the elderly population with no physician visits in the past two years does not vary greatly by place of residence. Information on physician visits per year indicates that persons living in medium-sized SMSAs have the highest number of physician visits per year, and persons in counties not adjacent to SMSAs have the lowest average number of visits per year (table 38).

These lower levels of use in rural areas may be due to nonfinancial barriers to access facing rural residents. In addition to having a lower physician-to-population ratio, rural residents face longer travel times to their source of care than their metropolitan counterparts do (table 39). Rural residents are about twice as likely as urban residents to have to travel more than 30 minutes to their regular source of medical care (physician office or hospital clinic).

TABLE 38

Persons 65 and Over with No Physician Visits in Previous Two-Year Period and Average Number of Physician Visits per Person 65 and Over per Year, 1975

Place of Residence	Percentage with No Visits	Number of Visits per Person per Year
Within SMSA	15.3	6.9
Large SMSA	15.3	6.5
Core county	15.8	6.4
Fringe county	13.8	6.8
Medium SMSA	16.1	7.8
Other SMSA	13.8	6.2
Non-SMSA counties	14.8	6.1
Adjacent to SMSA	13.9	6.3
Not adjacent to SMSA	16.0	5.8

Source: Health Resources Administration, Health of the Disadvantaged: Chartbook, tables 25B, 27B, pp. 80, 82.

TABLE 39

Travel Time to Regular Source of Care, 1970

	Percentage Less than 15 Minutes	Percentage 15-20 Minutes	Percentage 31-60 Minutes	Percentage More than 1 hour
SMSA central city	51	40	8	2
SMSA other urban	58	34	7	1
Urban, non-SMSA	70	23	6	2
Rural, nonfarm	44	44	10	2
Rural, farm	21	55	21	4

Source: Lu Ann Aday and Ronald Andersen, Development of Indices of Access to Medical Care (Ann Arbor: University of Michigan Health Administration Press, 1975), table 3, p. 22.

They are also slightly more likely to have to wait more than 30 minutes after arriving before they receive care (table 40). These differences are most noticeable for the farm population. The effect of these factors on the rural elderly's access to care is difficult to assess precisely. Because most elderly persons are retired, the time price of trips to the doctor's office is less than for younger persons. A large proportion of the elderly (about 50 percent) suffer from activity limitations that may make the trip to a physician difficult or even hazardous without assistance. It is possible that the long travel times leave the rural elderly, particularly those who are partially disabled, less able or perhaps less willing than the urban elderly to seek medical care.

The fact that rural residents tend to spend more time waiting to see a physician at their usual source of care than nonfarm residents do may be a result of the tendency of farm residents to be "walk-ins" rather than to make appointments (table 41).

TABLE 40

Office Waiting Time at Regular Source of Care, 1970

	Percentage Immediate	Percentage 1-30 Minutes	Percentage 31-60 Minutes	Percentage More than 1 hour
SMSA central city	8	47	21	25
SMSA other urban	7	58	24	11
Urban, non-SMSA	6	49	27	18
Rural, nonfarm	7	47	24	22
Rural, farm	4	29	39	28

Source: Aday and Andersen, Development of Indices of Access to Medical Care, table 6, p. 27.

TABLE 41

Percentage Distribution of Patients by Appointment or Walk-In Visits at Regular Source of Care, 1970

Residence	With Appointment	Walk-In	Total
SMSA			
Central city	74	26	100%
Other urban	85	15	100%
Non-SMSA			
Urban	77	23	100%
Rural, nonfarm	71	29	100%
Rural, farm	59	41	100%

Source: Aday and Andersen, Development of Indices of Access to Medical Care, table 6, p. 27.

Examining data on physician use by race, residence, and income does not in itself provide a particularly good indication of whether different subgroups of the elderly have achieved equity of access to medical care. In the section on health status, it was pointed out that a number of socioeconomic and demo-

graphic characteristics are related to health status. It seems reasonable, therefore, to expect that these same characteristics are also related to use of physician services. However, because the magnitude of the relationship cannot be predicted, it is reasonable to examine physician use while controlling for health status.

Health Interview Survey data indicate that the number of physician visits per year increases with the degree of activity limitation (table 42). This is true for both men and women, regardless of age. It is interesting to note that individuals over 75 with the most severe activity limitations average fewer physician visits per year than their younger counterparts.

TABLE 42

Number of Physician Visits per Person per Year among Individuals over 65, by Sex and Type of Activity Limitation, 1971

	Not Limited in Activity	Limited but Not in Major Activity	Limited in Amount or Kind of Major Activity	Unable to Carry On Major Activity
Male				
65-74	4.0	7.7	6.9	10.4
75+	3.4	a	7.0	9.7
Female				
65-74	4.7	7.3	10.8	13.8
75+	5.2	5.8	9.5	11.8

Source: National Center for Health Statistics, Physician Visits: Volume and Interval Since Last Visit, United States, 1971, table 13, p. 27.

a. Figure does not meet standards of reliability or precision (more than 30 percent relative standard error).

Given evidence that elderly blacks (1) have a higher rate of physician service utilization than elderly whites and (2) have more chronic illnesses and disability, it might be asked whether there are racial differences in the ratio

of reported disability to physician contacts. Here results are not consistent. Health Interview Survey data show that blacks and other nonwhites over 65 average fewer physician visits per restricted activity day than whites do, and the differences between whites and nonwhites in the ratio of physician visits to bed disability days are even more pronounced (table 43). Wan, on the other hand, shows that for a given level of disability (no limitations to severe limitations), blacks average more visits than whites, particularly with respect to minor limitations. Blacks reporting no limitations in a one-year period are more likely to see a doctor during that time than elderly whites are, but the two groups are about equally likely to see a doctor if they report two or more episodes of illness in a one-year period (table 44).

TABLE 43

Physician Use-Disability Ratios by Race for Persons over 65, 1971

	White	Minority	Black Only
Physician visits per restricted activity day	.18	.10	.10
Physician visits per bed disability day	.57	.24	.24

Source: Health Resources Administration, Health of the Disadvantaged: Chartbook, tables 16, 17, 25B, pp. 69, 80.

TABLE 44

Mean and Adjusted Mean of Physician Contacts for the Elderly, by Income, Health Status Variables, and Race

Independent Variables	Total		Black		White		Ratio
	Mean	Adjusted Mean	Mean	Adjusted Mean	Mean	Adjusted Mean	Black/White (Adjusted Mean)
Annual Family Income							
Less than $5,000	6.64	6.23	7.21	6.74	6.03	5.79	1.16
$5,000-$9,999	6.73	6.91	8.02	8.38	5.66	5.60	1.50
$10,000-$14,999	5.89	6.58	6.57	6.82	5.48	6.29	1.09
$15,000 and above	7.38	7.89	5.85	6.62	8.09	8.31	.80
Unknown	4.91	5.42	5.54	6.24	4.36	4.60	1.36
Episodic Illness							
None	5.12	5.42	5.90	6.20	4.39	4.68	1.32
One	8.57	7.69	8.59	7.78	8.55	7.55	1.03
Two or more	13.67	12.13	13.85	12.16	13.45	12.37	.96
Level of Disability							
Severe limitations	9.25	8.40	9.65	8.93	8.68	7.75	1.15
Moderate limitations	8.66	8.08	8.68	8.21	8.64	8.06	1.02
Minor limitations	5.87	5.13	8.14	7.14	3.88	3.47	2.06
No limitations	3.91	4.54	4.19	4.90	3.71	4.22	1.16

Source: Wan, "Access to Care, Health Status, and Health Services Utilization," table 5, p. 11.

Note: Adjusted means control for effects of other variables in this table plus health insurance variables and place (if any) of usual source of care, through multiple classification analysis.

When the effect of income differences on the use of medical services within different health status categories is examined, some inequities are evident. For all groups except the one whose members are limited in the amount or kind of activity, visits per year increase with income (table 45).

TABLE 45

Visits per Person per Year among Individuals over 65, by Chronic Disability Status and Income, 1973

	Income		
Disability Status	Less than $5,000	$5,000-$9,999	$10,000+
No limitation of activity	4.5	4.7	5.6
With limitation but not in major activity	4.9	5.4	5.8
With limitation in amount or kind of major activity	9.3	9.3	8.7
Unable to carry on major activity	9.4	10.2	12.5

Source: Peter Fox and Thomas Bice, "Socioeconomic Status and Use of Physician Services Revisited," Medical Care 14, no. 8 (August 1976): table 3, p. 716.

Information from the 1970 CHAS/NORC survey shows that the elderly poor have fewer physician visits per disability day than the nonpoor, especially in cases of prolonged disability (table 46). In comparison to other age groups, the number of visits by the elderly appears to be most affected by their income. It should be noted that the poverty determination in the CHAS/NORC survey is adjusted by family size. Thus, an older person living with his or her children's family might still be considered to be living in poverty at income levels over $6,000. This adjustment reduces some of the distortion caused by income controls used in the Health Interview Survey.

TABLE 46

Physician Use-Disability Ratio by Age and Poverty Level, 1970

Age and Poverty Level	Less than Six Disability Days in Two Weeks	Six or More Disability Days in Two Weeks	Total
	Use-Disability Ratio		
Under 17			
Above	15.6	14.4	14.9
Below	12.5	8.9	10.4
17-44			
Above	18.5	20.6	20.0
Below	16.1	13.1	14.0
45-64			
Above	20.7	10.7	12.5
Below	14.7	6.0	7.3
65 and over			
Above	22.1	19.6	20.1
Below	17.5	8.6	9.4
Total Population	17.1	13.5	14.4

Source: Lu Ann Aday, "Response to Critique of 'Economic and Noneconomic Barriers to the Use of Needed Medical Services,'" Medical Care 14, no. 8 (August 1976): table 1, p. 719.

The CHAS/NORC surveys from 1963, 1970, and 1976 provide a comparison over time of the elderly's use of physician services relative to need among different groups. The CHAS/NORC study compared the rate at which people saw a physician in response to symptoms with expert estimates of how often they should have seen a doctor. Deviations from the predicted norm are shown in table 47. The results indicate that the elderly in every income group saw physicians at lower than recommended rates in 1963. However, by 1976, every income group was estimated to have a physician use rate that exceeded the rate recommended by

the panel of experts. This excess use rate varied from 23.3 percent among the high-income elderly to 7.6 percent among the low-income elderly.

TABLE 47

Symptom-Response Ratio in Use of Physician Services by the Elderly, 1963, 1970, 1976

	1963	1970	1976
High income	-5.7	15.4	23.3
Middle income	-7.7	1.0	10.6
Low income	-22.5	-6.5	7.6

Source: Aday and Andersen, "Fostering Access to Medical Care," table 5, p. 39.

Note: A negative value indicates that people saw physicians less frequently than the panel recommended and a positive value indicates a higher than recommended use of services.

While these figures are interesting in themselves, aggregate statistics such as these do not show how physician use was distributed within the income groups. Certain groups of individuals such as minorities and rural residents may have had lower than recommended use rates even though aggregate data show a trend toward overutilization.

Information on the use of physician services relative to need by place of residence indicates that elderly residents of non-SMSA counties have slightly lower use-disability ratios than those living in SMSA counties (table 48). When bed disability days rather than restricted activity days are used in constructing the ratio, the non-SMSA resident shows a slight advantage. Earlier data (from 1971), presented in table 49, more clearly address the rural-urban issues by providing separate data on farm residents. Here the differences are more clear-cut. The 1971 data show non-SMSA elderly, particularly farm residents, to be clearly disadvantaged relative to elderly residents of SMSAs.

TABLE 48

Physician Use-Disability Ratios of Persons 65 and Over, by Place of Residence, 1975

Residence	Physician Visits per Day of Restricted Activity (all conditions)	Physician Visits per Day of Bed Disability (all conditions)
Within SMSA	.18	.51
Large SMSA	.19	.49
Core county	.18	.49
Fringe county	.20	.50
Medium SMSA	.19	.57
Other SMSA	.14	.45
Non-SMSA counties	.16	.53
Adjacent to SMSA	.15	.51
Not adjacent to SMSA	.17	.54

Source: Health Resources Administration, Health of the Disadvantaged: Chartbook, tables 16, 25B, pp. 69, 80.

TABLE 49

Physician Use-Disability Ratios by Age and Place of Residence, 1971

Residence	Physician Visits per Day of Restricted Activity (all conditions)			Physician Visits per Day of Bed Disability (all conditions)		
	All Ages	65-74	75+	All Ages	65-74	75+
SMSA	.33	.24	.18	.84	.67	.41
Non-SMSA						
Nonfarm	.28	.20	.16	.75	.58	.39
Farm	.24	.19	.12	.69	.69	.21

Sources: National Center for Health Statistics, Disability Days: United States, 1971, tables 1, 3, pp. 18, 20; idem, Physician Visits: Volume and Interval since Last Visit, United States, 1971, table 3, p. 17.

Access of the very old (those over age 75) is especially limited. Among the very old, the use-disability ratio of farm residents is 33 percent lower than the SMSA ratio for days of restricted activity and almost 50 percent lower than the comparable SMSA ratio for days of bed disability.

Aday and Andersen report use-disability ratios of rural and urban populations and introduce a control for income by stratifying the sample, distinguishing persons above and below the poverty line. Their data indicate that for whites aged 65 and over, use is lower relative to need in rural than in urban areas, regardless of whether the population is poor or affluent (40 percent lower than urban for persons below the poverty level and 30 percent lower than urban for persons above the poverty level) (table 50).

TABLE 50

Physician Use-Disability Ratios, by Age, Race, Place of Residence, and Poverty Status, 1970

Residence	White		Nonwhite	
	Under Age 65	Age 65 and Over	Under Age 65	Age 65 and Over
	Below Poverty Line			
Urban	9.83	11.80	13.07	3.55
Rural	11.03	7.15	10.13	8.04
	Above Poverty Line			
Urban	16.84	21.32	15.45	a
Rural	14.08	15.19	a	a

Source: Aday and Andersen, Development of Indices of Access to Medical Care, table 13, p. 45.

a. Sample size to small to provide reliable estimates.

This evidence suggests that there may be a special interaction between low incomes and rural residence, with poverty reducing access to a greater extent in rural than in urban areas. Because poor persons are unlikely to

own automobiles and because public transportation is usually poorly developed or nonexistent in nonmetropolitan areas, the reduced access of the poverty-stricken rural elderly may reflect their inability to obtain transportation to and from physicians' offices. Financial barriers to receiving medical treatment itself should be less important than for the general population and should not vary according to place of residence. Because the elderly poor may be enrolled in both Medicare and Medicaid, their financial liabilities (depending on eligibility criteria and state generosity in Medicaid benefit packages) for most medical services should be minimal.

Another method of assessing the accessibility of physician care is to examine the type of care sought. Kravits and Schneider classified the types of care received by individuals in their study into three categories: elective care only; both elective care and mandatory care; and mandatory care only (table 51).

TABLE 51

Average Number of Physician Visits of Persons 65 and Over, by Kind of Service Received, Race, and Poverty Status

Race and Poverty Status	Mean Number of Physician Visits for Those with Visits	Elective Care Only	Both Elective and Mandatory Care	Mandatory Care Only
Black	8.2	.87	2.20	5.10
Above poverty	7.1	.76	1.47	4.88
Below poverty	10.7	1.11	3.09	6.45
White	7.0	1.11	2.45	3.45
Above poverty	7.2	1.14	2.61	3.45
Below poverty	6.7	1.05	2.23	3.42

Source: Kravits and Schneider, "Health Care Need and Actual Use, by Age, Race and Income," table 10-1, p. 176.

Kravits and Schneider conclude from their study that a greater proportion of physician visits made by elderly blacks than by elderly whites are for mandatory services only. However, Kravits and Schneider find that poor elderly blacks see physicians more frequently than poor elderly whites; thus, the mean number of elective care visits for poor blacks is actually somewhat higher than for poor whites and is about the same as the rate for nonpoor whites. Blacks above the poverty level, however, are significantly less likely to see a physician for elective reasons than whites above the poverty level are. These findings suggest that nonpoor blacks who are not eligible for Medicaid assistance are less likely to use a physician unless absolutely necessary. Looking at differences in service use by income only, Kravits and Schneider conclude that income does not significantly affect whether elective or mandatory care is sought.

Perhaps the best method of assessing the relationship between various socioeconomic characteristics and health status is multivariate analysis. Bivariate tables give an indication of differences in use of services by specific characteristics, but they are incapable of controlling for other factors which also affect the relationship in question. Multivariate analysis makes it possible to analyze the independent influence of one variable on the demand for medical care without contaminating that influence with the indirect effects of other related factors. Andersen and Newman have conducted one such analysis of the determinants of medical care utilization.

The Andersen and Newman analysis of the relative importance of different factors in predicting physician utilization concludes that both income and race should be considered of "medium" importance in predicting physician utilization, but neither income nor race is as important as perceived and evaluated level of illness.[5] Andersen's analysis of the simple relationship (not taking other

variables into account) between physician contact and various independent variables found that for all ages, family income explained only .2 percent of the variance in utilization. Multiple classification analysis indicated that family income ranked ninth in a field of eleven variables in its capacity to predict physician contact; perceived illness, regular source of care, education of household head, and physician-to-population ratio were all more important than income, although race was found to have a lower independent effect when these other variables were taken into account. Andersen's analysis does not, however, consider utilization of services by the elderly alone.[6]

Davis and Reynolds also provide an analysis of the determinants of medical care utilization in an effort to assess the impact of Medicare and Medicaid on use of services.[7] Their findings on demand for care by the elderly indicate that health status plays the dominant role in determining the number of physician visits a person will make. When controlling for health status as measured by activity limitations, chronic conditions, and restricted activity days, they found that physician visits increase uniformly with income. This result is consistent with that found in a number of previously mentioned studies. In addition, their results indicate that public assistance recipients receive 30 to 40 percent more services than other low-income persons not receiving such aid. Apparently, the lower cost sharing that results from Medicaid's payment of the deductible and coinsurance affects the demand for services. That this is true when health status is held constant suggests that the explanation previously given--that low-income persons in bad health are more likely to seek out public assistance and hence more likely to use services--is only a partial explanation.

Davis and Reynolds found that race is a significant determinant of service use only in the South. Elderly southern blacks in average health make only one-half as many physician visits as other elderly persons. This result may be due in part to the fact that a number of southern states did not have comprehensive Medicaid programs at the time the study was undertaken. Estimates of the relationship between geographic location and service use indicate that no significant differences exist between urban and rural residents outside the South. However, elderly residents of nonmetropolitan areas in the South make significantly fewer physician visits than the urban elderly.

Wan provides additional information on the effects of different factors on physician use. His results indicate that health status as measured by the number of episodic illnesses and level of chronic disability has a significant impact on the number of physician contacts by the elderly (table 52). This result holds for both blacks and whites. However, income appears to be a significant determinant only among blacks. The heavy concentration of blacks in low-income categories may mask some of the relationship between income and service use.

The three multivariate studies discussed above reinforce many of the results suggested in the bivariate tables. The major findings in this section on the determinants of physician utilization by the elderly can be summarized as follows:

- Health status is an important determinant of physician use by the elderly. However, it is not the only determinant, and variables not considered to represent "need" also continue to exert an important influence on demand.

- Income is positively related to use of services in most studies; however, the relationship between income and physician visits appears to be U-shaped in some studies, perhaps reflecting the poor's higher level of insurance coverage as well as their greater need for care.

- The probability of having any contact with a physician during a two-year period is lower among the poor.
- Southern blacks use less medical services relative to need than other members of the population.
- Elderly persons living on farms have fewer physician visits per year and experience more barriers to obtaining care than other individuals.
- Among the elderly, persons over 75 make more visits to physicians than those aged 65 to 74, reflecting their lower health status and greater need for services.

TABLE 52

Multiple Classification Analysis of the Effects of Access to Medical Care and Health Status Variables on Physician Contacts for the Elderly, by Race

	Total		Black		White	
Independent Variables	Eta^2	$Beta^2$	Eta^2	$Beta^2$	Eta^2	$Beta^2$
Health insurance coverage	0.026	0.012[a]	0.029	0.017[a]	0.014	0.008
Usual source of care	0.040	0.020[a]	0.032	0.014[a]	0.048	0.029[a]
Annual family income	0.008	0.004[a]	0.008	0.005	0.012	0.010[a]
Number of episodic illnesses	0.063	0.036[a]	0.048	0.027[a]	0.084	0.053[a]
Level of chronic disability	0.078	0.040[a]	0.068	0.036[a]	0.084	0.048[a]
R^2:		0.153		0.133		0.185

Source: Wan, "Access to Care, Health Status, and Health Services Utilization," table 4, p. 10.

Note:

	Total	Black	White
Number of persons	1,987	951	1,036
Mean of annualized physician contacts	6.20	6.86	5.59

a. Significant at 0.05 or lower level.

B. HOSPITAL UTILIZATION BY THE ELDERLY

Hospitalization is generally associated with severe illness. Thus, groups with higher mortality rates and a greater prevalence of severe health problems would be expected to use hospitals more than those in better health. Utilization of acute-care hospital facilities is more closely dependent on a physician's clinical diagnosis of a patient's health condition than on the patient's self-perception of his or her condition. There is also likely to be less discretion in the use of hospital care, since individuals may have no alternative to hospitalization if they wish to improve their health status. While there may be suitable substitutes for physician outpatient care, there are few substitutes for inpatient care in acute-care facilities. It is also possible that some individuals are hospitalized because they did not obtain appropriate medical care in the earlier stages of their illnesses.

Information from the Health Interview Survey indicates that the elderly are more likely to experience a hospital episode during a one-year period than younger members of the population (table 53). This relationship is stronger for men than for women because a large proportion of women aged 15 to 44 experience hospital stays associated with childbirth. Comparisons by race indicate that elderly whites and nonwhites are more likely to experience hospital episodes than younger members of their races but that elderly nonwhites are less likely to experience a hospital episode than whites. Since hospitalization often occurs in the last stage of life, the lower mortality rate of elderly nonwhites may account for some of this difference.

Comparisons on the basis of hospital days indicate that among those hospitalized, the elderly experience more hospital days than younger members of the population (table 54). The distribution by number of days for the elderly is approximately equal for men and women and for whites and nonwhites.

TABLE 53

Percentage Distribution of Persons with or without Short-Stay Hospital Episodes, 1972

	Hospital Episodes	
	None	One or More
Male		
All ages	91.6	8.4
Under 15	93.9	6.1
15-44	93.4	6.6
45-64	88.3	11.7
65+	82.6	17.4
Female		
All ages	87.4	12.6
Under 15	94.6	5.4
15-44	83.5	16.5
45-64	88.0	12.0
65+	83.9	16.1
White		
All ages	89.3	10.7
Under 15	94.2	5.8
15-44	88.4	11.6
45-64	88.0	12.0
65+	83.0	17.0
All Other		
All ages	90.2	9.8
Under 15	95.0	5.0
15-44	87.3	12.7
45-64	89.3	10.7
65+	86.5	13.6

Source: National Center for Health Statistics, Persons Hospitalized by Number of Episodes and Days Hospitalized in a Year: United States, 1972, Vital and Health Statistics, Series 10, no. 116 (Washington, D.C.: U.S. Government Printing Office, August 1977), tables 1, 2, pp. 12, 13.

TABLE 54

Percentage Distribution of Persons with One or More Hospital Episodes in Past Year, by Number of Hospital Days, 1972

	Number of Hospital Days			
	1-7	8-14	15-30	31+
Male				
All Ages	59.2	19.8	13.4	7.6
Under 15	80.4	10.5	6.0	3.0
15-44	67.7	18.8	8.2	5.3
45-64	48.7	23.5	18.1	9.6
65+	34.8	26.5	24.2	14.3
Female				
All Ages	68.0	17.6	9.9	4.6
Under 15	82.3	9.9	5.4	2.4
15-44	79.3	13.0	5.8	1.9
45-64	50.4	27.5	15.1	7.0
65+	37.6	27.2	21.9	13.4
White				
All Ages	65.2	18.3	11.0	5.6
Under 15	83.5	9.5	5.1	1.8
15-44	77.3	14.2	5.8	2.7
45-64	50.3	25.5	16.4	7.8
65+	36.6	26.9	22.8	13.8
All Other				
All Ages	60.4	19.4	13.1	7.1
Under 15	67.6	14.8	9.4	8.3
15-44	68.6	16.9	10.7	3.8
45-64	42.7	26.9	18.1	12.4
65+	33.3	27.8	24.9	a

Source: National Center for Health Statistics, Persons Hospitalized by Number of Episodes and Days Hospitalized in a Year: United States, 1972, tables 22, 23, pp. 34, 35.

a. Sample size too small to make reliable estimates.

The previous section on health status indicated that elderly blacks and the elderly poor are more likely to experience severe activity restrictions and functional limitations than the rest of the elderly population, which would suggest that those two groups would use hospital facilities more than other groups. However, the lower death rates among nonwhites may counteract this somewhat.

Data from 1975 on the number of hospital discharges per 100 persons indicate that for persons with yearly incomes below $10,000, racial minorities have lower discharge rates than whites (table 55). For persons with yearly incomes above $10,000, nonwhites exhibit slightly higher discharge rates. Examining discharge rates by income level indicates that among whites, those with family incomes below $5,000 have somewhat higher discharge rates than those with higher incomes. Among nonwhites, the lowest-income group has a higher discharge rate than the middle-income group but a somewhat lower rate than those with family incomes in excess of $10,000.

Information from the Health Interview Survey on discharge rates in 1964 and 1973 indicates that there has been some increase in hospitalization since the advent of Medicare and Medicaid (table 56). The increase in discharge rates is particularly evident among poor whites. In 1964, poor nonwhites experienced higher discharge rates than poor whites, but by 1973, the discharge rate for poor whites was higher than for nonwhites.

Although hospitalization is generally associated with severe illness, it may also be associated with elective surgery and discretionary procedures performed in hospitals because of convenience and the availability of diagnostic equipment and specialized services. Anderson maintains that discretionary medical admissions accounted for 17 percent of all hospital admissions and

TABLE 55

Number of Discharges from Short-Stay Hospitals per 100 Persons over 65, per Year, by Income and Race, 1975

	Discharges per 100 Persons over Age 65
Race	
White	25.3
Racial minority	22.2
Black only	21.8
Race and Income	
White	
Under $5,000	26.5
$5,000-$9,999	24.9
$10,000 and above	24.2
Racial Minority	
Under $5,000	23.9
$5,000-$9,999	17.3
$10,000 and above	30.7

Source: Health Resources Administration, Health of the Disadvantaged: Chartbook, table 36B, p. 88.

TABLE 56

Number of Discharges from Short-Stay Hospitals per 100 persons 65 and Over, per Year, by Income, Color, and Age, 1964 and 1973

	White		Nonwhite	
Year	Poor	Nonpoor	Poor	Nonpoor
1964	17.9	20.3	18.7	18.1
1973	25.5	23.4	19.4	22.2

Source: Wilson and White, "Changes in Morbidity, Disability, and Utilization Differentials between the Poor and the Nonpoor," table 1, p. 638.

diagnostic admissions accounted for 23 percent.[8] Thus, lower discharge rates for nonwhites and the poor do not necessarily mean that those who should be hospitalized are not receiving needed services. Differences in discharge rates could result from higher utilization of discretionary hospital services by whites.

Unlike physicians, who are disproportionately located in metropolitan areas, hospital beds are distributed roughly proportional to population in both rural and urban areas. This would suggest that hospital use would be more evenly distributed between rural and urban areas than physician visits are. Health Interview Survey data indicate that rates of hospitalization are only slightly lower in rural than in urban areas (table 57).

TABLE 57

Percentage Distribution of Persons Aged 65 and Over, by Number of Hospital Episodes and Place of Residence, 1972

Residence	None	One	Two	Three or More
SMSA	83.5	12.8	2.5	1.2
Non-SMSA	83.0	11.9	3.6	1.5
Nonfarm	82.7	12.1	3.7	1.5
Farm	85.6	9.7	a	a

Source: National Center for Health Statistics, Persons Hospitalized by Number of Episodes and Days Hospitalized in a Year: United States, 1972, tables 5, 12, pp. 16-17, 24.

a. Data do not meet tests of statistical reliability.

In 1972, 14.4 percent of the farm elderly used hospital inpatient facilities, compared with 16.5 percent of the elderly in SMSAs. However, the farm elderly were more likely than the urban elderly to experience more than one hospital episode.

Davis and Reynolds found that when they controlled for health status, there continued to be a variation in the number of hospital episodes among subgroups of the elderly (table 58). The number of hospital episodes continued to be related to income within each health status category.

TABLE 58

Average Hospital Episodes for the Elderly, by Health Status and Family Income Adjusted for Other Determinants

	Health Status		
Family Income	Good	Average	Poor
Under $5,000	.114	.210	.362
$5,000-$9,999	.140	.250	.427
$10,000-$14,999	.159	.285	.472
$15,000+	.177	.312	.512

Source: Karen Davis and Roger Reynolds, "The Impact of Medicare and Medicaid on Access to Medical Care," in The Role of Health Insurance in the Health Services Sector, ed. Richard N. Rosett (New York: National Bureau of Economic Research, 1976), table 9, p. 414.

Racial differences in hospital episodes also continue to exist but they are confined to the South. The Davis-Reynolds results indicate that when measures of availability of medical services are omitted from the estimating process, the elderly living in rural areas experience more hospital episodes than those living in urban areas. In addition, Davis and Reynolds found that the supply of physicians contributed negatively to admissions, apparently indicating a substitution of physician care for hospital care in areas where physicians are more abundant.

Differences in hospital use may be more evident when length of stay, rather than number of hospital episodes, is examined. Health Interview Survey

data from 1964 and 1973 indicate that the average length of stay by the elderly in short-term hospitals has not changed since the advent of Medicare. Nonpoor minorities are the only group whose average length of stay increased (table 59). Poor whites and nonwhites average about the same number of days per hospital episode, and nonpoor minorities have longer lengths of stay than their white counterparts. Additional data from NCHS on average length of stay for 1975 indicate that nonwhites in the middle-income range experience shorter lengths of stay than whites, but minorities at either income extreme have longer average lengths of stay than whites (table 60).

TABLE 59

Average Length of Stay (in Days) for Discharges from Short-Stay Hospitals among Persons 65 and Over, 1964 and 1973

Year	White		All Other	
	Poor	Nonpoor	Poor	Nonpoor
1964	12.4	11.7	11.8	15.7
1973	12.5	11.2	12.8	19.3

Source: Wilson and White, "Changes in Morbidity, Disability, and Utilization Differentials between the Poor and the Nonpoor," table 2, p. 639.

TABLE 60

Average Length of Stay (in Days) for Discharges from Short-Stay Hospitals among Persons 65 and Over, by Race and Income, 1975

Income	White	Racial Minority	Black Only
All incomes	11.8	14.5	14.9
Under $5,000	11.5	14.9	
$5,000-$9,999	11.3	8.8	
$10,000 and above	12.6	13.0	

Source: Health Resources Administration, Health of the Disadvantaged: Chartbook, table 37B, p. 89.

The lower admission rate of low-income nonwhites, coupled with their lower physician use-disability ratios, suggests that racial minorities may be less likely to get timely diagnoses of their problems. However, there has been no rigorous evaluation of whether blacks do in fact delay seeking care. Anderson reports that a panel of physicians found that when blacks do go to a doctor, they are in poorer health than white patients, but there is no evidence that blacks wait longer, once symptoms develop, to seek care.[9]

To contrast to the HIS finding, Wan's analysis of 1,987 elderly persons living in areas served by neighborhood health centers finds that elderly blacks averaged fewer hospital days than elderly whites. Blacks averaged 4.91 days per hospital episode compared to 5.61 for whites.[10] Wan notes that for elderly blacks, the chronic disability variable accounted for more of the variance than the episodic illness variable did and was the strongest predictor of hospitalization. For whites, episodic illnesses were the strongest predictor of hospitalization, with usual source of care ranking second, and chronic disability third (see table 61).

Wan's findings contrast with those of the Health Interview Survey taken two years earlier. The reasons for this may be due to differences in the nature of the samples on which the estimates were based. First, Wan reports that among users of specific health facilities, those using hospital ambulatory services as their regular source of care were most likely to have had longer hospital stays. Available data indicate that blacks are far more likely than whites to use hospital ambulatory services as their regular source of care.[11] Second, although the difference was not statistically significant, whites were found to have shorter average stays than blacks in cases where the patient was covered by hospital insurance only, with no supplementary medical insurance.

Since there is evidence that a greater proportion of elderly whites than elderly blacks participate in Part B of Medicare, longer hospital stays for elderly blacks might be expected, particularly in areas where neighborhood health centers and public health clinics are also not available to low-income blacks.

TABLE 61

Multiple Classification Analysis of the Effects of Access to Medical Care Status Variables on the Number of Days in Short-Term Hospitals for the Elderly, by Race

	Total		Black		White	
Independent Variables	Eta^2	$Beta^2$	Eta^2	$Beta^2$	Eta^2	$Beta^2$
Health insurance coverage	0.001	0.004	0.001	0.004	0.005	0.004
Usual source of care	0.026	0.017[a]	0.029	0.011[a]	0.029	0.020[a]
Annual family income	0.001	0.000	0.004	0.002	0.002	0.009
Number of episodic illnesses	0.044	0.029[a]	0.029	0.017[a]	0.063	0.044[a]
Level of chronic disability	0.032	0.017[a]	0.036	0.023[a]	0.032	0.014[a]
R^2:		0.081		0.078		0.100

Source: Wan, "Access to Care, Health Status, and Hea[illegible] Utilization," table 6, p. 12.

Note:

	Total	Black	White
Number of persons	1,987	951	1,036
Mean of short-term hospital stay (nights)	5.28	4.91	5.61

a. Significant at 0.05 or lower level.

Information by geographic region for 1972 indicates that there is little difference between rural and urban residents in average length of stay. Because these data are gathered through household interviews, they are not affected by the tendency of rural residents to go to city hospitals for complicated surgery or specialized facilities (table 62).

TABLE 62

Percentage Distribution of Persons 65 and Over with One or More Short-Stay Hospital Episodes, by Length of Stay

Residence	1-7 Days	8-14 Days	15-30 Days	30 or More Days
SMSA	36.4	27.1	23.0	13.5
Non-SMSA	36.3	26.7	22.8	14.2
Nonfarm	36.5	26.8	22.7	13.9
Farm	34.4	a	a	a

Source: National Center for Health Statistics, Persons Hospitalized by Number of Episodes and Days Hospitalized in a Year: United States, 1972, table 26, p. 38.

a. Data do not meet tests of statistical reliability (not significantly different from zero).

Davis and Reynolds also attempted to identify the determinants of hospital length of stay, holding constant the effects of all variables except the one in question. Their results indicate a positive relation between income and hospital days, but the difference between income groups is not nearly as great as it is for physician visits. The Davis-Reynolds results pertain to all the elderly, however, and not just to those who have been hospitalized. After controlling for factors other than place of residence, rural residents were not found to experience significantly fewer days of hospitalization than urban residents. Davis and Reynolds also found that outside the South, race had no significant relation to length of hospital stay, but that southern blacks experienced significantly fewer days of hospitalization than the rest of the population. However, as mentioned earlier, the Davis-Reynolds study used data from 1969, a time when many southern states either did not have Medicaid programs or provided limited benefits to their Medicaid-eligible populations. Expansion of state Medicaid programs since 1969 has been most rapid in the

South, and differentials in program coverage and expenditures among states have narrowed considerably during the 1970s.[12] The increased program expenditures and benefit coverage in the South may have improved access to health care among poor blacks to the extent that the 1969 racial differences in use of services no longer exist.

In summary, the available information on hospitalization of the elderly suggests the following:

- The elderly experience more hospital episodes and have longer hospital stays than younger members of the population.
- Evidence on differences in hospital discharge rates between whites and racial minorities is mixed. Multivariate analysis indicates that southern blacks have lower discharge rates and shorter average lengths of stay than whites after controlling for health status. However, this may be due to the inadequacy or unavailability of Medicaid services in the South at the time the analysis was conducted.
- Within each health status category, direct relationships exist between income and admissions and between income and length of stay.
- Rural residents experience somewhat more hospital episodes than urban residents perhaps because they subsititute the more available inpatient care for the scarcer ambulatory care.

V. SUMMARY AND CONCLUSIONS

The evidence presented in this paper indicates that there are substantial variations in health status among the elderly and that these differences are related to factors such as income, race, and place of residence. However, it is evident that either certain groups of the elderly are receiving less medical care than is commensurate with their health status or that some groups are overconsuming medical care.

Examination of the relationship between income and health status indicates that although the poor experience a disproportionate share of health problems, they see physicians less frequently than wealthier persons. Comparison of service use by income class among persons with similar health status shows that the poor are considerably less able to provide for their health care needs than persons with higher incomes. Multivariate analysis, controlling for health status and the effects of other variables, points to a positive relation between use of medical care and income. Public policies intended to promote equity of access by reducing financial barriers to medical care apparently have not fully realized this objective. The finding that low-income elderly receiving assistance use more medical services than those not receiving aid, even when health status is controlled, suggests that the coinsurance and deductible provisions of Medicare may limit demand for services. Whether the effect is to reduce overutilization or to prevent individuals from obtaining needed care is not known.

A related question about the income-health status relationship that has not been addressed is the problem of two-way causation between these variables. Longitudinal information which provides data on health status and income changes over time is needed to sort out the causal relationship between income and health. Also, it is not known whether income exerts a direct effect on health status or if the income-health relationship results from the association of income with other factors such as diet, housing quality, and occupation, which may also be related to health status.

Evidence on differences in health status and medical care utilization between the races is somewhat ambiguous. Elderly blacks have higher life expectancies and lower mortality rates than whites beginning around age 70. However, blacks are somewhat more likely to experience chronic activity limitations and have more disability days than whites.

Comparisons of medical care utilization of blacks and whites are also mixed. Blacks appear less likely than whites to have any contact with a physician over a two-year period. However, among those having some physician contact, poor blacks make more physician visits than poor whites.

When use of medical resources relative to need is examined by race, findings also vary. Health Interview Survey data indicate that the physician use-disability ratio is lower among nonwhites. Wan, on the other hand, finds a somewhat higher use of physician care by elderly blacks when blacks and whites with the same health status are compared. Davis and Reynolds found that southern blacks were particularly disadvantaged in their ability to meet their health care needs but that racial differences in other parts of the country were not significant. The rapid expansion of Medicaid programs in the southern states since the time of the Davis-Reynolds study may have eliminated the black

disadvantage in use of health services. The inability to ascertain the relationship of race to medical utilization is due partly to the fact that relatively few studies use multivariate analysis in determining use of services. It is also not clear whether blacks and whites receive care of similar quality.

Differences in the health status of urban and rural residents are not apparent. However, residents of areas not adjacent to SMSAs have fewer physician visits per year than those in other locations. Rural residents also face longer travel and waiting times when they do visit physicians. Information on physician use-disability ratios indicates that among individuals over 75, elderly farm residents use fewer physician services per day of disability than those living in other areas. Access to transportation to health care facilities may be more difficult among the oldest members of the rural population. Improving transportation to facilities might improve this group's access to health care. Data on hospitalization indicate no substantial differences between urban and rural residents.

While this paper has highlighted some of the major differences in health status and medical care utilization among the elderly and related these differences to certain demographic and economic characteristics, a number of policy-relevant questions remain unanswered. For example, the relationship between past health practices and current health status has not been sorted out. If the health status of the elderly today is a reflection of inequitites in access to care in the past, perhaps public policies should be addressed toward improving individuals' access to care before they reach age 65. Expansion of Medicaid coverage may be one way to accomplish this objective. However, although this policy alternative may affect the health status of later generations of elderly, it will do little to improve the health of the current elderly population.

Furthermore, the relationship between use of services and health status itself is not known. If improving the health status of the elderly is one of the goals of current policy, there may be less costly means to achieve this end than by disproportionately subsidizing medical care, which encourages individuals to substitute medical care for alternative methods of improving their health. Income subsidies, for example, might have an equal or greater effect on health status. In particular, payments to the elderly under the Social Security Administration's Old-Age Survivors, Disability, and Health Insurance and Supplemental Security Income programs, which are a major source of transfer income to the elderly, might be increased. The specific issue to address is whether a given increase in transfer income would have a greater effect on health than an equivalent expenditure on medical care.

Studies such as those discussed here, which examine use of medical care on a service-by-service basis, do not provide information on interactions and substitutions between different types of services. It is possible that individuals who are least likely to see physicians are receiving care through other channels.

Clearly, additional information is needed before informed policy decisions can be made. A longitudinal study that relates health practices and income changes over time to health status would be extremely helpful, and its findings could have important policy implications. Additionally, increased use of multivariate analysis can provide a better indication of the independent influence of one factor on health status and health service use, controlling for the effects of other variables. The result will be a better understanding of the health problems faced by the elderly and the effectiveness of current programs in increasing access to medical care and improving health status.

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